NPS-CM-21-017

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Improving the Contractor Responsibility Determination Process

December 2020

Capt. Anita M. Naylor, USAF

Thesis Advisors: Dr. Daniel Reich, Assistant Professor
Dr. William Muir, Assistant Professor

Graduate School of Defense Management

Naval Postgraduate School

Prepared for the Naval Postgraduate School, Monterey, CA 93943.

ACQUISITION RESEARCH PROGRAM
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The research presented in this report was supported by the Acquisition Research Program of the Graduate School of Defense Management at the Naval Postgraduate School.

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ABSTRACT

Stemming from the President's Management Agenda, the Office of Management and Budget has set goals per functional area to guide the federal government's modernization. The goal for acquisitions is to be frictionless, or to be able to deliver commercial items at the same speed as the market and non-commercial items by using modern business practices and technologies. The contractor responsibility determination process is an acquisition process that occurs at least once for every contract and, if modernized, would affect the speed at which every contract is awarded. Initial research reveals that the execution of this process is not standardized throughout and within the different federal agencies, lacks compliance, and does not meet the intent of the policy stated in Federal Acquisition Regulation (FAR) 9.1. Using a business process improvement method, the contractor responsibility determination process is dissected to reveal issues. Potential solutions are then discussed to solve these issues. One of these solutions is then prototyped and field-tested. The thesis ends with a discussion of alternative processes and recommendations on those processes that could follow the same analysis and prototype development pattern.

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ABOUT THE AUTHORS

Captain Anita Naylor is currently a student at the Naval Postgraduate school pursuing her Master of Business Administration with a focus in Strategic Sourcing. Her previous assignment was as both a contract manager and contracting officer within the Operational Contracting Unit at Space and Missile Center/Los Angeles Air Force Base. She was responsible for managing many different types of contracts, including services, commodities, and construction for customers such as the Medical and Force Support squadrons.

Captain Naylor was accepted into the ROTC program at Florida State University during the Fall of 2012 as a High School Scholarship candidate. She earned her commission and awarded the honor of Distinguished Graduate in the Spring of 2016. She was selected for a special duty tour straight out of ROTC, called the Gold Bar Recruiter Program. She was one of 20 selected to travel the United States educating high school students about scholarship opportunities that AFROTC offers.

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ACKNOWLEDGMENTS

First, I want to thank those who have had a heavy hand in helping me with this thesis. First, thank you, Lieutenant Colonel Muir, not only for introducing me to this topic idea, but also for being the main reason my prototype exists. Without your knowledge, this thesis would have been just another prescriptive work that may or may not have ever been implemented. With my prototype, I have been able to showcase many of the changes that need to occur within the CRD process. Thank you so much, Lt Col Muir, for being a unicorn in the contracting career field! I also want to thank Daniel Reich, my other advisor. Thank you for your consistency and advice. I appreciated both so much throughout this entire process. You're a great yang to Lt Col Muir's yin. Finally, I want to thank Matt Norton at the NPS Graduate Writing Center. Thank you for reading over my paper more than most!

I also want to thank all the different teams who I have worked on during this project. A huge shoutout to both the IRS's David Gill and the Army's Innovation Team's Elizabeth Chirico and Craig Stiller. Mr. Gill was the originator of the idea of using innovative technology in the CRD process, and Liz and Craig took the idea and pushed it out to all the DoD. Both teams were instrumental in creating an environment where technologies, such as RPA, can be successfully implemented in the government's business processes. I also want to thank the DHS team, Polly Hall and Scott Simpson. This team is really doing extraordinary stuff. Not only have they been able to get AI into a business process, but they are not limiting themselves as to how the policy and current process look. Thank you both for being willing to push against the status quo, because it honestly gives me a lot of hope for the future of the DoD.

Finally, I want to thank my 815 Air Force cohort. All of you have heard me say some version of "This relates to the research I'm doing in my thesis by…" or "I know this because of my thesis…" too many times to count. Thanks for letting me talk your ears off about it whenever I got the chance. Also, a special shoutout to Rob Ocampo and Jason Passarella. Thanks for starting this thesis journey at the same time I did and providing all your feedback. It's greatly appreciated!

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LIST OF ACRONYMS AND ABBREVIATIONS

AF	Air Force
AFARS	Army Federal Acquisition Regulation Supplement
AFFARS	Air Force Federal Acquisition Regulation Supplement
AI	artificial intelligence
API	application programming interface
ATO	ability to obtain
BMP	benchmarking process
BPI	business process improvement
BPM	business process management
BPO	business process optimization
BPR	business process reengineering
BVA	business-value added
CAC	common access card
CO	contracting officer
COC	certificate of competency
CPARS	Contractor Performance Assessment Rating System
CRD	contractor responsibility determination
CRS	Congressional Research Service
CWS	contract writing system
DBB	Defense Business Board
DoD	Department of Defense
DORA	determination of responsibility automation
DFARS	Defense Federal Acquisition Regulation Supplement
DUNS	Data Universal Numbering System
D&F	determination and finding
EIT	executive improvement team
FAPIIS	Federal Awardee Performance and Integrity Information System
FAR	Federal Acquisition Regulation
FPDS	Federal Procurement Data System
GSA	General Services Administration

IRS	Internal Revenue Service
LPTA	lowest price technically acceptable
MBA	Master of Business Administration
MEM	mandatory elements of a method
NCMA	National Contract Management Agency
NMCARS	Navy and Marine Corps Acquisition Regulation Supplement
OMB	Office of Management and Budget
PDF	portable document format
PIN	personal identification number
PIT	process improvement team
PO	process owner
QBL	qualified bidder list
QML	qualified manufacturer list
RVA	real value added
SAM	System for Award Management
SB	small business
SBA	Small Business Administration
SAT	simplified acquisition threshold
SECDEF	Secretary of Defense
SMC	Space and Missile Center
SME	subject matter expert
SOP	standard operating procedures
USG	United States Government
VAA	value-added assessment
VAAR	Veterans Affairs Acquisition Regulation

I. INTRODUCTION

The President's Management Agenda set goals for federal agencies to increase the efficiency and effectiveness of their business processes (Office of Management and Budget [OMB] & General Services Administration [GSA], 2020). A business process "refers to a wide range of structured, often chained, activities or tasks conducted by people or equipment to produce a specific service or product for a particular user or consumer. Business processes are implemented to accomplish a predetermined organizational goal" (Techopedia, 2017, para. 1). One business process conducted by the U.S. government (USG) is the contractor responsibility determination (CRD). A CRD is when "contracting officers (COs) determine prospective contractors' responsibility prior to each contract award by considering information submitted by the contractor or otherwise acquired by the agency" (Manuel, 2013). This task is conducted by COs, the federal government's title for its purchasing officials, and includes such structured activities as checking government websites, reviewing the contractor provided information, and gathering additional data as required to meet the standards and requirements set forth in Federal Acquisition Regulation (FAR) 9.1 (2020). The predetermined goal of this process is stated in FAR 9.103: "Purchases shall be made from, and contracts shall be awarded to, responsible prospective contractors only" (2020). This paper looks to increase the efficiency and effectiveness of the CRD process to help agencies achieve their goals.

Public procurement policy requires COs to complete the CRD process every time they award a contract or make a purchase (FAR 9.103). This means that, for every purchase and award the federal government executes, this process will be done at least once; it may be done multiple times if additional purchases are made by the CO from a single contract. In 2019, the federal government contracted for $593 billion in goods and services, an amount that had steadily increased over the previous five years (Snyder, 2020). This almost $600 billion was spread over roughly 15 million purchases (GSA, 2020). For each of these purchases, the CRD process was also executed. It follows then that any increase in efficiency and effectiveness in the execution of a CRD could be extended up to 15 million times.

To that end, this paper analyzes the CRD process using a five-stage business process improvement (BPI) methodology. BPI is a systematic methodology developed to help an organization make significant advances in the way its business processes operate (Harrington, 1991, p. 20).

A. ANALYSIS QUESTIONS

This research uses BPI to answer three main questions surrounding the CRD process:

1. How are CRDs currently executed within the USG?
2. How is the current CRD suboptimal in terms of effectiveness and efficiency?
3. What changes can be made to address the issues found in Question 2?

B. ANALYSIS PURPOSE

The main purpose of this analysis is to provide recommendations on how best to increase the effectiveness and efficiency of the CRD process. Utilizing a BPI methodology, Chapters V and VI provide a comprehensive list of recommendations on how to improve the CRD process while prototyping some of those recommendations. Improving the effectiveness and efficiency of the CRD process helps fulfill strategic goals of the federal agencies (OMB & GSA, 2020).

A secondary purpose of this analysis is to provide a detailed overview of the current CRD process. Because each agency may have unique requirements beyond what is stated in the FAR for contractor responsibility, some agencies may not be able to adopt the prototype developed or recommendations discussed. However, this analysis can still be useful to those agencies. Using the methodology in this report can help agencies reduce the time required to improve the CRD process.

C. METHODOLOGY

To improve the CRD process, this paper employs a method introduced in H. J. Harrington's (1991) book *Business Process Improvement* to improve the CRD process. Harrington created a five-phase model for BPI, providing objectives and activities for each phase. The method begins with setting up a receptive environment to the process

improvement; then understanding the current process. The next phase is streamlining the process, followed creating measurements and controls for the new process. Finally, the last phase deals with the continuous improvement of the new process (Harrington, 1991). Chapter IV delves deeper into each of the phases.

D. LIMITATION

A limitation of this analysis is that the CRD process is only analyzed at the FAR level and not at the level of any of the agencies' FAR supplements (e.g., AFFARS, DFARS). While this use of only FAR-level guidance may limit the direct application of the findings, it allows this analysis to be as generalizable as possible, meaning that any agency can adopt improvements suggested in this research. In addition to the recommended improvements found in this research, agencies should also examine their own supplements to see whether any additional requirements for a CRD must be addressed.

E. ORGANIZATION OF REPORT

The remainder of the thesis is organized into seven chapters. Chapter II is a review of literature related to business process improvement. Chapter III provides an overview of the CRD process, and Chapter IV provides a detailed explanation of the phases of the BPI method. Chapters V and VI apply the methodology to the CRD process: Chapter V analyzes the current CRD process by executing activities from the BPI method's Phases I through III, while Chapter VI utilizes Phases III through V of the BPI method to design a solution to the issues found in Chapter V. Chapter VII provides concluding thoughts and next steps for improving the CRD process.

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II. BUSINESS PROCESS IMPROVEMENT LITERATURE REVIEW

There are many varied but similar methodologies for improving a business process; business process management (BPM), business process reengineering (BPR), business process improvement (BPI), and business process optimization (BPO) are some of the more common approaches. BPR is "a systematic, disciplined improvement approach that critically examines, rethinks, and redesigns mission-delivery processes in order to achieve dramatic improvements in performance in areas important to customers and stakeholders" (Information Resources Management Policies and Issues Group, 1997, p. 65). Janelle Hill (n.d.), a distinguished analyst in BPM research, explained that while BPR emphasizes radical efforts to redesign key operational processes, BPM's "less radical, more tolerant approach for mid-course corrections provides time for the organization to assimilate process improvements and learn new management disciplines" (para. 6). This less radical approach may arise from the fact that BPM focuses on "activities such as manufacturing, marketing, communications and other major elements of a company's operations" (Zairi, 1997, p. 2) and any changes that occur should be "based on a continuous approach to optimization" (Zairi, 1997, p. 2). Xi et al. (2013) defined another process improvement approach, BPO, as "a strategy that develops, improves and optimizes the business processes to maintain competitive advantage" (p. 19) by reducing redundancies in an enterprise process. Finally, BPI is a "systematic methodology developed to help an organization make significant advances in the way its business processes operate" (Harrington, 1991, p. 20) by "aim [ing] to reduce waste and/or variation in processes to achieve the desired outcome by using existing resources in a better way. The goal of BPI is to bring out a drastic change in an organization's performance, rather than bringing out the changes in incremental steps" (Techopedia, 2012, para. 4).

Based on the definitions of the different approaches, BPI is appropriate for analyzing the CRD process for two reasons: one, BPI emphasizes reducing waste and variation at the process level, and two, BPI's outcome is meant to be radical change to a process rather than incremental change. The CRD is only a single process involved in the larger pre-award process, so a suitable approach to improve it would need to concentrate

on improving operational processes, like BPR or BPI do, rather than modifying enterprises or major elements of a company's operation, like BPO or BPM do. Because the purpose of this analysis is to provide recommendations on improving the CRD process and conducting CRDs in a drastically more efficient and effective manner, the method used for improving the process needs to be produce radical change. Between BPI and BPR, BPI produces more radical change than BPR does.

Even within BPI, however, there are many different approaches used to improve a business process. To avoid getting "lost in the 'improvement black box'" it would be useful to have directions and rules that support the act of process improvement. A method can be a meaningful solution to provide this demanded support because it is a goal-oriented systematic approach, which helps to resolve theoretical and practical tasks" (Zellner, 2011, p. 204). The best methodology, according to Zellner, is when a methodology meets all mandatory elements of a method (MEMs) because then the improvement methodology would have clearly defined steps, create results after each step, have techniques in place for performing each step, have assigned roles, and be reproducible (2011, p. 206). After reviewing literature from methods engineering, Zellner (2011) found the following to be mandatory elements of a method:

- Procedure model: the order of activities to be fulfilled when employing the method.
- Technique: a way of generating results; supports an activity.
- Results: an artifact (e.g., a document, etc.) created by an activity.
- Role: the one who carries out the activity and is responsible for it.
- Information model: the previously described elements and their relationships. Information models are also used to represent the results. (p. 206)

According to Zellner's (2011) analysis, Six Sigma, as a BPI approach, meets the most mandatory elements (four), while five other approaches either fully accomplish or partly accomplish/implicitly mention three elements: Harrington's BPI (1991), Lee and Chuah's (2001) SUPER methodology for BPI, McAdam's (1996) integrated business improvement methodology, Povey's (1998) best practice BPI methodology, and Paper's (1998) holistic framework for BPI adopted at Caterpillar Inc. Figure 1 shows the extent to which different BPI methodologies meet the mandatory elements of a method (Zellner, 2011, p. 212).

Author(s)	Approach	Mandatory elements of a method				
		Activities	Techniques	Role	Results	Information model
Harrington (1991) and Harrington (1995a)	BPI	•	⊙	⊙	○	○
Pande *et al.* (2000), Breyfogle (2003) and Harry and Schroeder (2006)	Six Sigma	•	•	⊙	⊙	○
Dalmaris *et al.* (2007)	Framework for the improvement of knowledge-intensive business processes	•	○	○	○	○
Rohleder and Silver (1997)	A tutorial on BPI	⊙	•	○	○	○
Coskun *et al.* (2008)	WABPI methodology	○	○	○	○	○
Lee and Chuah (2001)	A SUPER methodology for BPI	•	•	⊙	○	○
McAdam (1996)	An integrated business improvement methodology	•	•	⊙	○	○
Siha and Saad (2008)	SAM framework for BPI	○	⊙	○	○	○
Khan *et al.* (2007)	BPI framework	○	○	⊙	○	○
Adesola and Baines (2005)	MIPI methodology	•	•	○	○	○
Povey (1998)	Best practice BPI methodology	•	•	⊙	○	○
Varghese (2004)	Strategy for launching meaningful BPI	•	•	○	○	○
Seethamraju and Marjanovic (2009)	Process knowledge in business process improvement methodology	•	○	○	○	○
McAdam and McIntyre (1997)	BPI methodology with focus on learning organization concepts	○	○	○	○	○
Paper (1998)	Holistic framework for BPI adopted at Caterpillar Inc.	•	⊙	⊙	○	○
Bisson and Folk (2000)	Case study for BPI	•	○	○	○	○

Notes: •, fully accomplished or mentioned; ⊙, partly accomplished or implicitly mentioned; ○, not accomplished or not mentioned

Figure 1. Structured Evaluation of Process Improvement Approaches. Source: Zellner (2011).

Though Six Sigma meets the most MEMs, it is not a suitable approach for improving the CRD process because it requires users to obtain a certification prior to beginning any improvement efforts. Six Sigma initiatives must be implemented by individuals who have been "exposed to the complete Six Sigma Body of Knowledge and have been required to meet a minimum standard of proficiency for Six Sigma and its implementation" (Council for Six Sigma Certification [CSSC], 2018, "Need Training First?"). Individuals receive different colored "belts" based off each level of proficiency they achieve, with master black belts being the most proficient individuals (CSSC, 2018). Employing a method within the USG that is open for anyone to use is ideal as it would enable employees or agencies to analyze the CRD process without having to first become certified in a particular approach.

Aside from Six Sigma, there are the five BPI approaches that meet at least three of the MEMs. To help differentiate the remaining five methods, counting the number of cites on Google Scholar, a form of quick citation analysis is a useful approach. Citation analysis is "the process whereby the impact or 'quality' of an article is assessed by counting the number of times other authors mention it in their work" (UIC University Library, 2020,

para. 1). Out of the remaining five approaches, Harrington's (1991) BPI approach is the most cited on Google Scholar by a factor of two over the remaining approaches. Even when controlling for the age of the work, Harrington's BPI method still is the work with the highest average number of cites per year.

Reviewing Harrington's (1991) BPI method to make sure it fits within the definition of BPI shows that it is a representative method for achieving the goals of BPI in general and this analysis in particular: Harrington's five-phase approach highlights improving a process, not an enterprise-wide element, and emphasizes radical change versus incremental change. Because Harrington's BPI approach displays many of the elements to be considered a method, aligns with the definition of BPI, and it is popular within the field of BPI, I chose it as the best methodology to analyze the CRD process.

III. OVERVIEW OF CONTRACTOR RESPONSIBILITY

The person who should be in charge of "ensuring that the total process is both effective and efficient" should be a process owner (Harrington, 1991, p. 45). A process owner "should have a good understanding of the process" (Harrington, 1991, p. 47). To that end, this chapter provides a brief background on the role of contractor responsibility in federal contracting, beginning with a history of contractor responsibility and an overview of the responsibility regulations. Then the chapter covers the two processes involved in finding a contractor responsible. Finally, the chapter summarizes the current technology used within the CRD process, the process which this research seeks to improve.

A. BACKGROUND OF CONTRACTOR RESPONSIBILITY

"The Federal Acquisition Regulation (FAR) states that no contract award shall be made unless the contracting officer makes an affirmative determination of the contractor's responsibility" (Rendon, 2006). The federal government "enjoys the unrestricted power ... to determine those with whom it will deal and fix the terms and conditions upon which it will make needed purchases" (*Perkins v. Lukens Steel Co*., 1940, para. 15). Since the beginning of federal procurement law, contractors have had to meet certain qualifications. In the report *The U.S. Federal Procurement System: An Introduction*, Yukins (2017) described the beginnings of "responsibility":

> From early on, the federal system developed a means of addressing contractor qualification—what is now called "responsibility" under Federal Acquisition Regulation (FAR) Part 9.12. Only "men of substance and talents" were allowed to win government contracts, a precursor to today's highly evolved qualification system to assess prospective contractors' potential reputational and performance risks. During these early decades of the republic, the federal government also began to delegate substantial discretion to contracting officers. Much as the federal procurement system relies on "responsible" contractors, so too does it depend on professional and highly engaged contracting officers, who (like "responsible" contractors) sharply reduce the risks of corruption and performance failure. (p. 71)

Prior to the responsibility of contractors being codified, court cases show that there was a propensity for the federal government to avoid giving contracts to nonresponsible bidders,

yet not until the late 1940s was the term *responsibility* included in federal procurement statutes (Manuel, 2013). Since the FAR was enacted in 1980s, contractor responsibility has been codified into law in FAR 9.1, Responsible Prospective Contractors (Manuel, 2013).

Currently, the FAR is made up of the regulations guiding procurement processes in the federal government and is codified in Parts 1 through 53 of Title 48, Chapter 1, of the Code of Federal Regulations (FAR 1.105-1). The FAR has been the main source of procurement regulation for the federal government since going into effect in 1984 (Manuel et al., 2015). Various federal agencies supplement the FAR with additional regulation; for example, the Defense Federal Acquisition Regulation Supplement (DFARS) is the Department of Defense (DoD) supplement. Under the DFARS, each of the services has its own supplements as well. The FAR includes broad language and guidance on different acquisition topics, with no details for individual organizations. The supplements then start to tailor that guidance as necessary for different missions performed by the different agencies.

Depending on the topic, the FAR or one of its supplements could have more to say about a subject in terms of the number of words in the section. When it comes to contractor responsibility, the FAR has over 5,500 words in Subpart 9.1, Responsible Prospective Contractors. By comparison, the DFARS, the DoD's FAR supplement, has a total of 1,318 words dedicated to this issue, and the AFFARS, the Air Force's FAR supplement, only has 331 words. The DFARS expands on the general standards (e) and (f) found in FAR Subpart 9.104-1 and provides further recommendations for the use of online tools. Aside from including a tailorable form to document the CRD, the AFFARS guidance provides instruction to the employees of the Space and Missile Center (SMC) on how to use a published list of contractors found nonresponsible in the space sector. Other supplements, such as the Army Federal Acquisition Regulation Supplement (AFARS), Navy and Marine Corps Acquisition Regulation Supplement (NMCARS), and Veterans Affairs Acquisition Regulation (VAAR), also have minimal additional guidance regarding the CRD process. Because the supplements add only minimal additional guidance, this research analyzes the CRD process using FAR guidance only. Because this paper uses only FAR guidance to craft recommendations for improvements to the CRD process, agencies only need to consider how their own supplement may influence any recommendations that choose to

adopt. Furthermore, with supplements containing minimal additional guidance for CRDs, agencies should be able to implement most of the recommendations provided in Chapter VI.

FAR 9.1 defines responsibility by qualities or actions. The policy subpart of FAR Part 9 states that when contracts are awarded based on lowest price alone, it can create "false economy if there is subsequent default, late deliveries, or other unsatisfactory performance resulting in additional contractual or administrative costs" (FAR 9.1). Thus, these actions are attributes of a contractor that is not responsible, thereby defining the term *responsible contractor* as a contractor that does not default or engage in "late deliveries or other unsatisfactory performance resulting in additional contractual or administrative costs" (FAR 9.1). This definition of responsible contractor is made even more specific within the requirements set forth in FAR 9.1, which states, "To be determined responsible, a prospective contractor must" and then provides the seven different requirements that contractors must meet: "(1) adequate financial resources; (2) ability to comply with the delivery or performance schedule; (3) satisfactory performance record; (4) satisfactory record of integrity and business ethics; (5) necessary organization and experience; (6) necessary equipment and facilities; and (7) otherwise qualified and eligible" (Manuel, 2013, "Summary").

The concept of responsibility provides an offset to the use of lowest price technically acceptable (LPTA) as a selection method for USG contract winners. Kate Manuel (2013), author of the Congressional Research Service (CRS) report *Responsibility Determinations Under the Federal Acquisition Regulation: Legal Standards and Procedures*, explained that because the government concentrates on awarding bids to the LPTA, making sure the contractor is responsible helps balance the LPTA approach. Ensuring contractor responsibility potentially helps the government avoid any additional contractual or administrative burden by verifying that the prospective offeror is not just submitting a low bid to win the contract, only to find later that they are incapable of providing the product or service.

B. HOW TO DETERMINE WHETHER A CONTRACTOR IS RESPONSIBLE

The FAR includes two mechanisms to ensure public contracts are only awarded to responsible contractors (Manuel, 2013). The first, a CRD, is done prior to every award. The second, debarment and suspensions, collectively referred to as exclusions, are determined without regard to a single award.

The first mechanism, the CRD, is completed by the CO prior to the award of every contract or purchase. To complete a CRD, the CO must analyze the contractor's information to see whether there is adequate evidence to determine the contractor responsible—information such as representations and certifications, past performance information, and bid-specific information. The determination occurs once the CO has analyzed this data to see whether the contractor meets the seven standards presented in FAR 9.104. If the CO does not have adequate information to affirmatively demonstrate the contractor's responsibility, then they shall not award to that contractor (FAR 9.1).

The second mechanism, exclusions, is not conducted by the CO and is not connected to a single award or purchase. Made up of debarments and suspensions, exclusions are attached to contractors due to prior actions they have committed and ban them from any future business with the USG for a set amount of time. Defined in another CRS report authored by Manuel (2008), "Debarment removes a contractor's eligibility for government contracts for a fixed period of time, while suspension temporarily debars a contractor for the duration of an agency investigation or litigation" ("Summary"). Suspensions last for as long as the investigation is ongoing into the contractor's actions and cannot exceed 18 months, while debarments can last up to three years depending on the severity of the offense (Manuel, 2008). Table 1 is replicated from the CRS report to help explain the difference between the two responsibility mechanisms.

Table 1. Comparison of Nonresponsibility Determinations and Debarment. Adapted from Manuel (2008).

	Nonresponsibility	Debarment
Decision-Maker	Contracting Officer	Debarring/suspending official (not the contracting officer)
Criteria	Adequate financial resources Ability to comply with delivery and performance schedule Satisfactory performance record Satisfactory record of integrity and business ethics Necessary organization and experience Necessary equipment and facilities Otherwise qualified and eligible	Fraud or criminal offenses in obtaining or performing a public contract or subcontract Violations of federal or state antitrust laws Embezzlement, theft, forgery, bribery, etc. Intentionally misusing "Made in America" designation Other offenses indicating a lack of business integrity or honesty that seriously affect the present responsibility of a contractor
Duration	Single contract award	Fixed time proportionate to the offense (generally not more than three years)
Application	Applies to companies that have not previously had government contracts, as well as current and prior government contractors	Generally applied to current government contractors, although potentially applicable to prospective or prior contractors
Due Process	Generally not	Yes
Review of Agency Determination	Responsibility determinations may generally be challenged with the GAO only when any special standards are not met or other "serious concerns" are raised	Exclusion determinations are generally not protestable with the GAO

Current regulation requires a contractor to be found responsible prior to being awarded a contract, meaning that a CO must conduct a CRD and make sure that the contractor is not under an exclusion. There are seven different criteria a contractor must meet prior to being found responsible by a CO conducting a CRD, listed earlier in this chapter. In addition to the seven standards the FAR uses to determine responsibility, there are more criteria that a contractor must meet. These additional criteria are called "collateral requirements" (Manuel, 2008) and deal with finding a contractor not responsible, meaning that if a contractor meets any of these criteria, the contractor cannot be found responsible. All these standards, criteria, and additional information required for a contractor to be

found responsible are covered in depth in Chapter V in the "Understanding the Process" section.

The CRD process varies depending on the dollar amount of the contract. During the process of conducting a CRD for a contract over a certain dollar threshold (referred to as the simplified acquisition threshold [SAT]), a CO "shall review the performance and integrity information available in the Federal Awardee Performance and Integrity Information System (FAPIIS)" (FAR 9.1). Below the SAT, which is currently at $250,000, COs are not required to view FAPIIS. Most importantly, the FAR requires every contract that a CO awards and utilizes FAPIIS as a source of information to document how the information from FAPIIS was used (FAR 9.1). Every contract file should at least contain documentation on how the information from FAPIIS was used to determine responsibility, but it may also contain a determination and finding (D&F) of responsibility (or some other templated form) to articulate why the CO ultimately found the prospective contractor responsible.

Depending on the agency, this D&F or other form may or may not be required. For example, the Army does require the use of a form to document responsibility, whereas the Air Force (AF) provides such a template but does not require COs to use it. Many of these forms contain primarily short answer responses for the CO to document how the contractor met each of the seven standards listed in the FAR and any special standards included in the solicitation. Also, some forms can only be accessed using a common access card (CAC) or some other type of two-factor authentication, or they are stored on CO's computers. For agencies that do not require CO's to use a specific form to document the CRD, COs who choose to document their determination may utilize a variety of processes to do so. However, even agencies that require a specific form can have varied processes, as there are many sources of information a CO can use to make a CRD besides just FAPIIS, such as the Federal Procurement Data System (FPDS), the Contract Performance Assessment Rating System (CPARS), and public rankings of companies (e.g., Fortune 500, U.S. News & World Report, etc.) (FAR 9.1).

C. CONTRACTOR RESPONSIBILITY DETERMINATION TECHNOLOGY

Another area of process knowledge of the CRD is not just how responsibility is determined but also what the current technologies are that are used in a CRD. The CRD process began with COs gathering what information they could from other COs to judge responsibility. The USG eventually realized that COs would benefit from a single system to add and pull information from regarding responsibility, which is why FAPIIS was created. As the name suggests, this system tracks performance and integrity information that could be relevant to a CO conducting a CRD. It is unclear if this website has been updated since its inception in 2010, but it will be moving to the new SAM.gov website soon. Figure 2 shows a screenshot from the FAPIIS website after a CO enters a contractor's DUNS number. Figure 3 is the screenshot from the "View Corporate Relationships" link within Figure 2. Clicking on any of the links under the section "FAPIIS Data" leads to the same webpage that defines each term. If there is a "Yes" under the "Records" column, the yes is hyperlinked to the record. SAM.gov, currently called beta SAM, will be a single-entry point to the many different procurement databases that GSA manages. The two main data sources used for responsibility determinations, FAPIIS and SAM, will be available from the same website and accessible through a customer-facing interface and through application programming interfaces (APIs). Figure 4 shows a screenshot of beta SAM's main webpage.

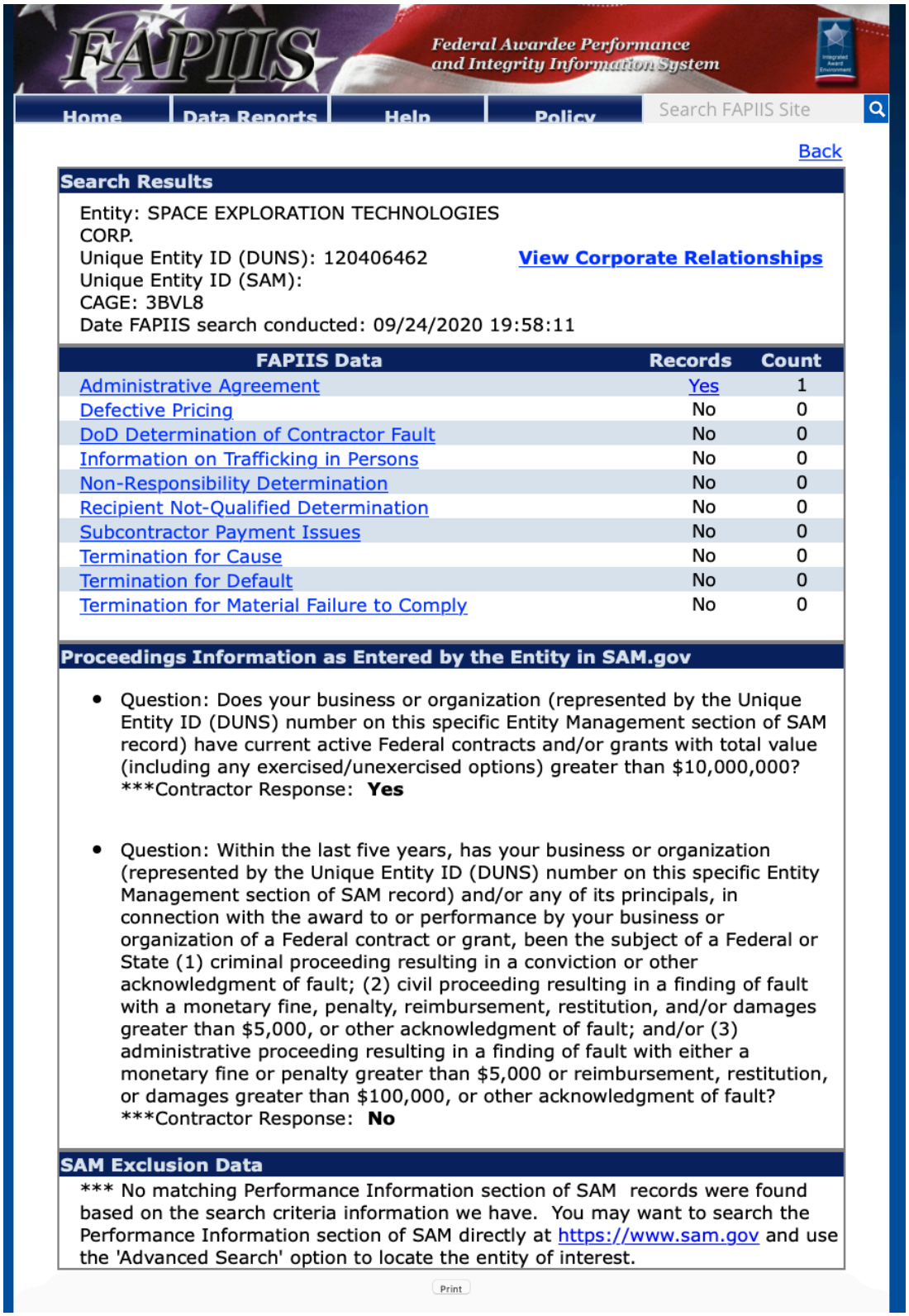

Figure 2. Screenshot from FAPIIS Webpage

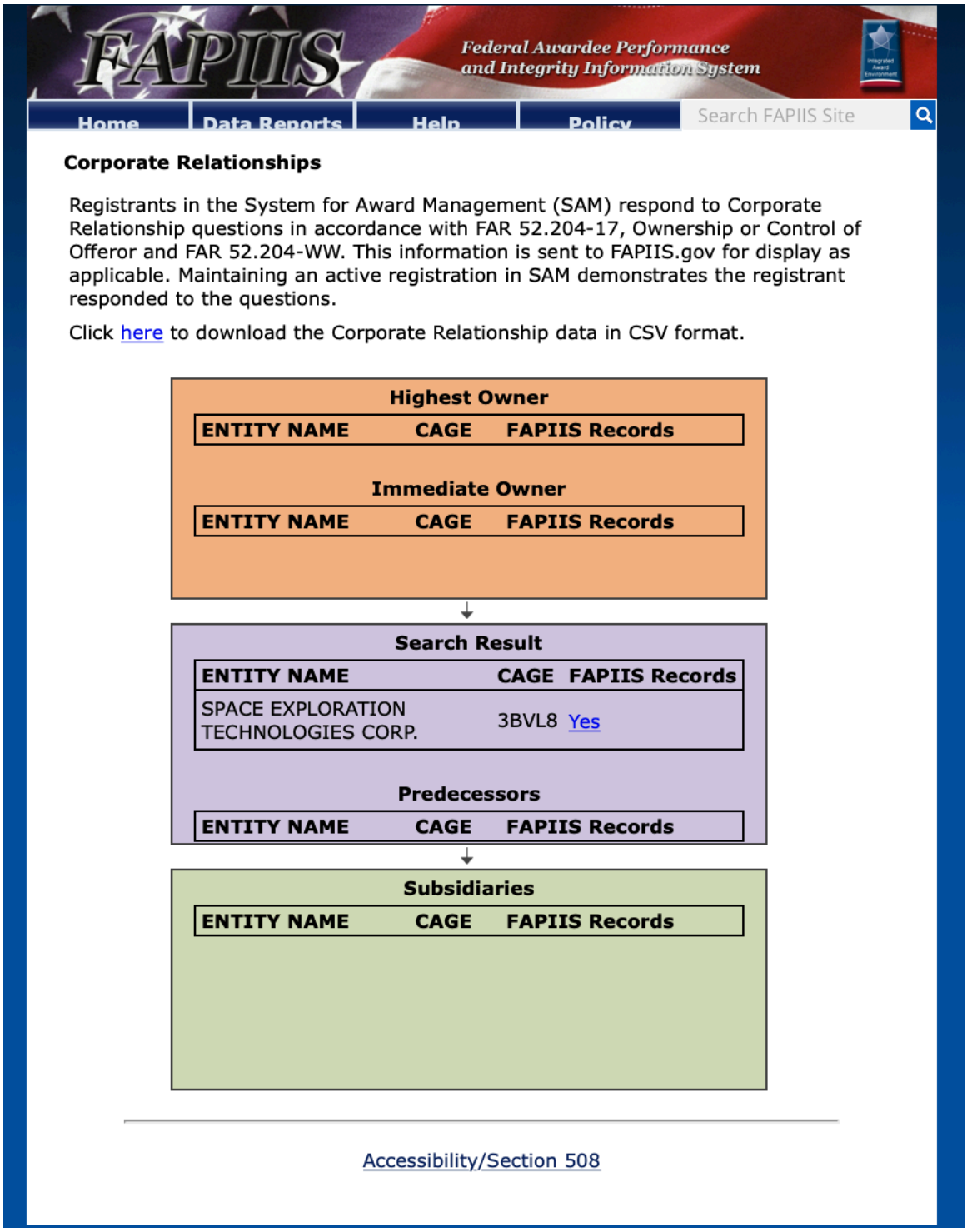

Figure 3. FAPIIS Corporate Relationships Screenshot

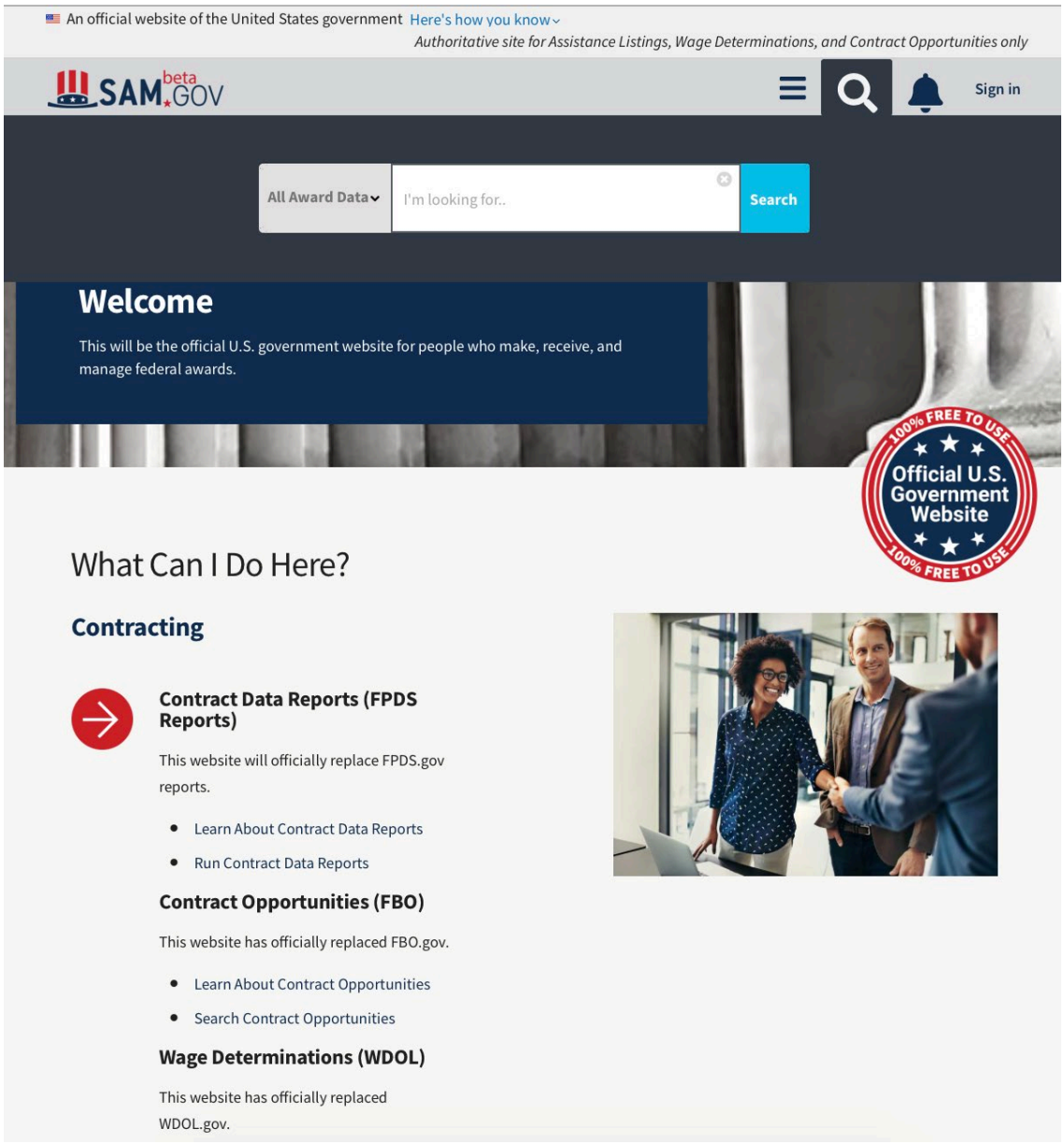

Figure 4. Beta SAM.gov Screenshot.

Most completed CRDs also make use of a document writer, such as Word or Adobe. If a CO chooses to complete a D&F for a responsible determination or determines a contractor to be nonresponsible, then the CO must use a program to document this information. The CO will put whatever information they found to support their determination in this file, place it in their contracting file, and send it to FAPIIS, if required.

A still-developing technology that is also used for CRDs is a digital contract file. In 2019, the USG required all agencies to move to digital filing systems (Vought & Ferriero, 2019). The move to digital files helped to reduce costs from paper products and related technologies necessary for printing and scanning, and it also allowed users to be able to access their files from wherever they were performing their job duties (Vought & Ferriero, 2019). Unfortunately, not all agencies have made the shift to a purely digital filing system since the publication of the rule. For example, many AF squadrons still either use strictly paper files or a mix of paper and digital files.

At least three different agencies working on improving the CRD processes with innovate procurement technologies. The first organization to pave the way for updating the CRD process was the Internal Revenue Service (IRS). In 2019, the IRS automated some of tasks that result in low-value time within the CRD process. The IRS's solution was to provide an email address an IRS user could email with the DUNS number of a prospective contractor in the subject line. Within minutes, the user receives a reply containing nothing but attachments—these attachments are the screenshots of the prospective contractor's SAM and FAPIIS webpages, as well as a short determination document. As one of the first processes within contracting to be automated using robotic process automation (RPA), the IRS's "bot," or a "configurable software set up to perform the tasks you assign and control" (Automation Anywhere, n.d.), garnered much attention from other agencies. Figure 5 shows a functionality overview of the IRS's bot. The functionality view explains how the improved process works from the view of the CO and the bot.

Another agency taking a similar approach as the IRS is the General Services Administration (GSA). The GSA bot is not yet production-ready, meaning it is still under development. Like the IRS, the GSA plans to have its employees send an email to an email address with a contractor's DUNS number, this time in the body of the email instead of the subject line. The reply from the bot consists of the attachments similar to those generated by the IRS's bot while also providing summary data in the body of the email, such as if the vendor has an active SAM registration, if their debt is subject to offset, if they have active exclusion records, and a handful of other objective data points. The attachments are the corporate relationship detail page from FAPIIS (Figure 3), the FAPIIS details page (Figure 2), the entity registration details page from SAM (Figure 6), and the entire list of

representations and certifications found on SAM. The "reps and certs" attachment is approximately 35 pages and contains much of the self-reported information contractors are required to supply.

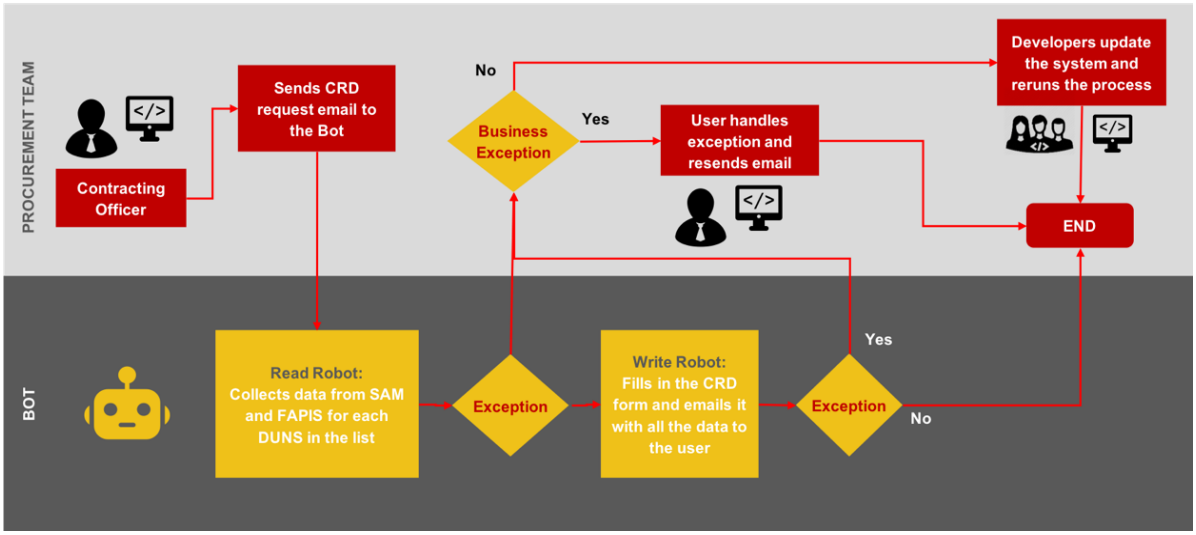

Figure 5. IRS Bot Functionality View. Source: Anika Systems, October 18, 2019.

SAM Search Results
List of records matching your search for :

Record Status: Active, Inactive
DUNS Number: 120406462

ENTITY	Space Exploration Technologies Corp.	Status: Active
DUNS: 120406462	+4:	CAGE Code: 3BVL8 DoDAAC:
Expiration Date: 11/03/2020	Has Active Exclusion?: No	Debt Subject to Offset?: No
Address: 1 Rocket Rd City: Hawthorne ZIP Code: 90250-6844		State/Province: CALIFORNIA Country: UNITED STATES

Figure 6. SAM Entity Registration Details Page.

The Army likewise built on the IRS framework. In contrast to the IRS, Army's improved CRD process has two bots: one for under–simplified acquisition threshold (SAT) purchases and another for over-SAT purchases. Depending on the value of the contract for

which the contractor submitted a proposal, the government user will email one of two email addresses. After the user has entered the relevant email address, the user enters the DUNS number in the subject line of the email. For under-SAT purchases, the bot returns the same attachments as the IRS's and the GSA's bots, with the addition of the beta SAM screenshot, which is the new GSA website under development that will incorporate both SAM and FAPIIS, and an under-SAT determination and documentation memorandum. The over-SAT bot returns the same attachments as the under-SAT bot as well as the memorandum for over-SAT purchases. This tool produces screenshots as attachments like the other bots but also does text-scraping from the webpages to assist in filling out the memorandum. Some of the fields on the memo, those that are objective, like if a contractor is debarred or not, are pre-filled by the bot before it returns the memo to the government user in the reply email. Army leadership, to gain standardization across their force, has decided to mandate the use of this bot in the CRD process.

As these different innovation efforts demonstrate, agencies have an interest in improving the CRD process. The next chapter describes Harrington's (1991) BPI methodology, which will be used to further improve the CRD process in three key areas: efficiency, effectiveness, and adaptability.

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IV. METHODOLOGY

In Chapter II, I determined Harrington's (1991) five phase business process improvement model to be the best fit for improving the CRD process. Though the idea of BPI is not a unique idea to Harrington, his BPI model aspires to radically change a process which is the focus of this paper. Each of his phases consists of objective and corresponding activities that must be performed before moving on to the next phase. Using this method, a business process can be improved to increase efficiency, effectiveness, and adaptability. Figure 7 replicates the model created by Harrington. Each section in this chapter describes the objectives and activities within each phase. This chapter summarizes the BPI model presented in the book *Business Process Improvement* by Harrington (1991).

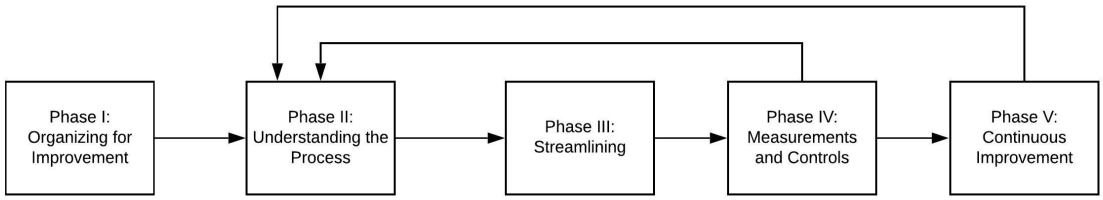

Figure 7. The Five Phases of BPI.
Adapted from Harrington (1991).

A. PHASE I: ORGANIZING FOR IMPROVEMENT

The first phase's objective is to organize support and resources for a busines process improvement effort. The first activities necessary to improve a process using BPI are to identify processes needing improvement, to make sure there is support for all the activities the improvement effort will require, and to organize the team in charge of the improvement effort. Table 2 shows the main objective and activities of Phase I of the BPI strategy set forth by Harrington (1991).

Table 2. Phase I of BPI: Objective and Activities.
Adapted from Harrington (1991).

Phase I. Organizing for improvement	
Objective	To ensure success by building leadership, understanding, and commitment
Activities	Establish EIT
	Appoint a BPI champion
	Provide executive training
	Develop an improvement model
	Communicate goals to employees
	Review business strategy and customer requirements
	Select the critical processes
	Appoint process owners
	Select the PIT members

First, according to Harrington (1991), "Launching a BPI effort requires top management's support" (p. 27). To make sure that a BPI effort receives the required attention from top management, the first activities in Phase I are creating an executive improvement team (EIT) and selecting a BPI champion, the person who oversees all the BPI efforts within a business unit. An EIT consists of executive-level managers who have authority to enforce changes resulting from any improvement effort throughout the relevant departments. Having top leadership provide "visible and active support" can be the difference between success and failure of a BPI effort (Harrington, 1991, p. 28). However, merely creating the EIT and champion positions is not enough to achieve a successful outcome; the personnel filling these positions must also be trained on their roles, which is the third activity under Phase I. Whether this training happens through weekly meetings or one-time events, it is essential that those involved in the EIT understand their positions are crucial to the BPI effort and are trained to understand their roles.

The next activity is for the EIT and BPI champion to choose a BPI model, which must include "a detailed plan of the steps that will be undertaken as the organization goes through the BPI cycle" (Harrington, 1991, p. 34). Harrington (1991) provides a list of steps based on his experience but emphasizes that organizations should make this model "reflect

your corporate culture, resources, capabilities, and experiences" (p. 34). Harrington also speaks to developing a scaled-down version of a BPI initiative to be used as a pilot situation "to better understand the potential return on investment" (p. 35).

After deciding on how to execute the process improvement model, the EIT and the BPI champion need to communicate their BPI goals to employees—activity five under Phase I. Employees need to feel comfortable with the ongoing BPI activities, because "the success of the BPI activities will depend on the degree to which our people embrace the changes made to the process" (Harrington, 1991, p. 115). Instead of approaching BPI through an organizational focus, where employees are the problem and the corporation is measuring the performance of individuals, leadership should take a process focus, where the process is seen as the problem and the company measures the performance of the process (Harrington, 1991). Likewise, explaining to employees that BPI's goal is to improve the reputation and standing of the company and not to maximizing profits will help employees be more comfortable with a BPI effort (Harrington, 1991).

Next, in activities five and six, after reviewing business strategies and customer requirements, the EIT should be able to identify the processes critical to the agency, i.e., the processes that have the most impact on the business's operations. Only processes that are critical to the agency should be selected for BPI efforts, since any process that are not critical may be considered additional bureaucracy, which BPI looks to eliminate (Harrington, 1991). These critical processes can be functional, meaning they exist within one department, or cross-functional, meaning the process flows across several functions or departments (Harrington, 1991). Reasons for selecting a process for improvement can include objections both inside and outside the organization, expensive procedures, awareness of a better operating method, and new technologies (Harrington, 1991).

However, many different processes may display these characteristics, so Harrington (1991) provides several approaches that an agency could take to select which process should improve first. The total approach is useful when an agency wants to update all of its processes at once, but Harrington points out that this approach only works for small companies because it is expensive and time-consuming. The management selection approach calls for the EIT to create two lists of 20: one is a list of processes that are critical

to the business, and the other is a list of processes that are causing the biggest difficulties for the company. These lists are then combined, and the processes on the list are then improved. By contrast, the weighted selection approach provides a more objective way to select a process for improvement by having leadership rate processes on a scale from 1 to 5 in four categories: "customer impact, changeability, performance, and business impact;" and the processes receiving the highest ratings are improved (Harrington, 1991, p. 38). Yet, even though the weighted selection is a more objective than the other approaches, the ratings are still quite subjective and can result in management's "pet projects" being pursued (Harrington, 1991, p. 38). Finally, the informed approach is another objective method for deciding which processes should be improved. This approach sets improvement priorities by judging how important the process is to external stakeholders and how much the process can be enhanced based on feedback from internal customers. Because this is the most objective approach, it relies heavily on data, therefore making it quite time consuming (Harrington, 1991).

To complete Phase I, the final activities are to appoint a process owner (PO) and select process improvement team (PIT) members. A PO "is the individual appointment by management to be responsible for ensuring that the total process is both effective and efficient" (Harrington, 1991, p. 45), with total process meaning the entire process undergoing a BPI effort. Criteria for selecting a process owner are having a stake in the process, power to act on the process, leadership ability, and process knowledge (Harrington, 1991). However, just because the PO is responsible for the improvement effort does not mean they are on their own. Agencies should consider providing either a process coordinator or process improvement facilitator to assist the PO in their responsibilities. The PO will also have the PIT to aide in the BPI effort. PIT members' major responsibilities include obtaining appropriate resources for the activity, implementing changes in the process, supporting change, training and involving other employees, and helping solve process-related problems (Harrington, 1991). After all this organizing is complete, the PO and PIT are ready to start understanding the assigned process and how it operates.

B. PHASE II: UNDERSTANDING THE PROCESS

After organizing for improvement, Phase II's objective is to understand what the current process looks like. Some of the activities for Phase II include defining scope, mission, and boundaries of the process, developing a process overview, and flowcharting the process. Table 3 shows the main objective and activities of Phase II of the BPI strategy set forth by Harrington (1991).

Table 3. Phase II of BPI: Objective and Activities. Adapted from Harrington (1991).

Phase II. Understanding the process	
Objective	To understand all the dimensions of the current business process
Activities	Provide team training
	Define the process scope and mission
	Define the process boundaries
	Develop a process overview
	Define customer and business measurements and expectations for the process
	Flow diagram the process
	Collect cost, time, and value data
	Perform process walkthroughs
	Resolve differences
	Update process documentation

After forming the PIT and giving ownership of the process improvement effort to the PO, the next activity is to train these individuals. In Phase I, the EIT received training, but in Phase II, the PIT and PO need to be trained. According to Harrington (1991), besides being trained on basic team dynamics and problem-solving, PITs should also receive training that helps them complete their tasks. Training in the following 10 fundamental tools of BPI should be included: "BPI concepts, flowcharting, interviewing techniques, BPI measurement methods, no-value-added activity elimination methods, bureaucracy elimination methods, process and paperwork simplification techniques, simple language analysis and methods, process walk-through methods, and coast and cycle time analysis" (Harrington, 1991, p. 67). After the team has been formed and trained, the following items

need to be understood by the PIT and defined for the BPI effort to be successful: BPI objectives, operating assumptions, process boundaries, process mission statement, and PIT name (Harrington, 1991).

The next two activities in Phase II, defining the scope of the process being improved and its mission and boundaries, need to be accomplished by the PO and occur after the PO gathers enough information to answer questions about inputs, outputs, and customers related to the process being improved. The PIT needs to state the boundaries of the process to help break up the process into logical, manageable pieces (Harrington, 1991). Boundaries help define what is and is not included in the process, what the inputs and outputs of the process are, and what departments are involved in the process (Harrington, 1991). Boundaries can be set as beginning, upper, lower, and end: the beginning boundary is where all initial inputs enter the process; the upper boundary accepts inputs any time throughout the process other than the initial process action; the lower boundary is where output occurs anywhere within the process; and the "output from the end boundary is the primary output of the process" (Harrington, 1991, p. 57). Boundaries can also include functional areas included in the process, like finance, human resources, and purchasing. A key step in determining what departments may be involved is to block diagram the process, but block diagraming should only be done after the improvement team speaks to personnel involved in the process and reads literature on the process (Harrington, 1991).

At this point, the team should begin to have an idea of what is involved in the process, but more data gathering is necessary before creating a process overview. Identifying the suppliers of the process' inputs and customers of its outputs and any interacting processes generates some of the additional information that may be necessary to fully understand the process (Harrington, 1991). To help identify the different types of customers, the team should know things such as who and where the final output goes, expectations of the process, and the impact if there is a problem during the process (Harrington, 1991).

The next activity in this phase calls for the PIT to define measurements and expectations for the process from both the customer's and the business's point of view. The PIT should also define goals for the business improvement effort, making sure they are

stated in terms of measurable outcomes. Measurements of these requirements are key to effectively improving the process because without them, a PIT cannot tell if they have achieved their goals. There are three main process measurements for BPI efforts: effectiveness, efficiency, and adaptability (Harrington, 1991), defined as follows:

Process effectiveness. The first main process measure, effectiveness, refers to how well as process satisfies customers' needs and expectations, which include "timeliness, accuracy, performance, reliability, usability, serviceability, durability, costs, responsiveness," and dependability of a process (Harrington, 1991, p. 75). Effectiveness is "having the right output at the right place, at the right time, at the right price" (Harrington, 1991, p. 74). The PIT is responsible for understanding the customer's expectations regarding the process and translating those into characteristics that can be measured and evaluated prior to any final output; the PIT is also responsible for creating a standard operating procedure that both the supplier and customer agree on (Harrington, 1991). There are multiple ways to measure the compliance of a process with these characteristics, such as customer feedback, surveys, focus groups, and monitoring complaints (Harrington, 1991).

Process efficiency. The next process measure is efficiency, which is "the extent to which resources are minimized and waste is eliminated in the pursuit of effectiveness" (Harrington, 1991, p. 74). Methods for measuring efficiency include "processing time, resources expended per unit of output, value-added cost per unit of output, percentage of value-added time, poor-quality cost" and "wait time per unit" (Harrington, 1991, p. 78). One of the most important elements of creating process efficiency is getting the appropriate value-added to no-value-added time ratio. Companies tend to focus on speeding up their value-added time, even though it accounts for a very small part of their process, instead of focusing on eliminating the no-valued-added time (Harrington, 1991). Key to achieving efficiency is error-free performance. Companies should signal that they expect no errors to occur, but if they do arise, a quick reaction should be possible to prevent them from reoccurring (Harrington, 1991).

Process adaptability. Finally, the third process measure is adaptability. Adaptability is "the flexibility of the process to handle future, changing customer

expectations and today's individual, special customer requests. It is managing the process to meet today's special needs and future requirements" (Harrington, 1991, p. 74). Also, "adaptable processes have the capacity to adjust, not only to meet the average customer expectation but to design intelligence into the processes so that they will be able to accommodate individual special needs and expectations" (Harrington, 1991, p. 81). A process that is adaptable can change quickly in the face of changing requirements, whether from the customer or from future business requirements. Adaptability is the hardest of the three requirements to measure but can be assessed through tracking how special requests are processed versus standard requests (Harrington, 1991).

Now that the PIT understands the bounds of the process and has set goals regarding how to measure success in its improvement effort, the team can begin creating a flowchart of the entire process. Flowcharting is "an invaluable tool for understanding the inner workings of, and relationships between, business processes" (Harrington, 1991, p. 86). Flowcharts can help elucidate the process visually, and they can help "highlight the areas in which rules or polices are unclear or are even being violated" (Harrington, 1991, p. 87). PITs should select the correct type of flowchart for their improvement effort. Some types of charts are block charts, American National Standards Institute (ANSI) flowcharts, functional flowcharts, and geographic flowcharts (Harrington, 1991). Depending on how complicated the process is, some PITs may even have to develop a data dictionary to accompany their flowchart (Harrington, 1991). The flowchart should portray the standard operating procedures of the process and not how employees are actually performing it, since there may be discrepancies between the required procedures and how the process is being performed.

After creating the flowchart, collecting time, value, and cost data is the next activity Phase II. Harrington (1991) argues that there are five characteristics of a process that the PIT must collect data: "flow, effectiveness, efficiency, cycle time, and cost" (p. 114). Effectiveness and efficiency have already been defined, while flow is the method for transforming input into output, and cycle time is "the time taken for the transformation from input to final output" (Harrington, 1991, p. 114). All this data should accompany any flowchart created of the process.

That said, the next activity is to perform process walkthroughs with employees to see the process from the employees' perspective. By speaking to employees involved in the process, the PIT can find out a great deal about the process itself and what improvements are likely to be embraced by the employees. In practice, employees may not follow the process the PIT diagrammed in the flowchart for many reasons, such as misunderstanding the procedures, being unaware of procedures, believing the method is too hard, not having been trained on the procedures, or having found a better way to execute the process (Harrington, 1991). The PIT should determine the tasks required to support each activity and provide a questionnaire to the employee to help guide the employees' feedback to the PIT (Harrington, 1991). Based on the walk-through, the PIT should categorize key problems as "occasional" or "chronic" (Harrington, 1991, p. 120).

Along with the list of problems identified from the walk-through, the PIT should also look for indicators that suggest poor performance in the characteristics Harrington identifies as necessary to understanding the process. To assess effectiveness, the PIT should look for indicators such as unacceptable products or services, customer complaints, backlog, redoing completed work, and incomplete output (Harrington, 1991). Data should be gathered by the PIT on these indicators to determine how any improvement efforts would likely affect them. To assess efficiency, the PIT should collect data on indicators such as cycle time, resource per unit, and wait time per unit (Harrington, 1991). Cycle time is so critical to improvement efforts that it should be given special attention as part of any efficiency measurement. Detailed data can be collected on cycle time in four different ways: "end-point measurements, controlled experiments, historical research, and scientific analysis" (Harrington, 1991, p. 124). Cost can be estimated for the entire process and then broken down by department, number of employees, and, finally, processing time per activity (Harrington, 1991).

After all the problem areas in the process have been identified, the PIT must resolve differences between the standard operating procedures (SOP) and how the process is executed, which is the ninth activity Harrington lists for Phase II. Resolving these differences means identifying which process areas have issues, such as not being completed

by employees correctly or being inefficient. If employees are performing a process in a way that differs from the formal procedures, then the PIT should take the modified version of the process into consideration during the BPI effort. They can annotate these differences in the process documentation, updating it to reflect current standards and processes. This is the final activity of Phase II.

C. PHASE III: STREAMLINING

With support for the BPI effort secured and the current process overviewed, the objective of Phase III is to address process efficiency, effectiveness, and adaptability. Activities in this phase include using cornerstone tools of streamlining to improve the performance of the process in these three categories. Phase III's objective and activities are shown in Table 4.

Table 4. Phase III of BPI: Objective and Activities. Adapted from Harrington (1991).

Phase III. Streamlining	
Objective	To improve the efficiency, effectiveness, and adaptability of the business process
Activities	Provide team training
	Identify improvement opportunities
	Eliminate bureaucracy
	Eliminate no-value added activities
	Simplify the process
	Reduce process time
	Error proof the process
	Upgrade equipment
	Standardize
	Automate
	Document the process
	Select the employees
	Train the employees

Streamlining comprises a variety of techniques that are fundamental to BPI; it employs methods that "create positive change in effectiveness, efficiency, and adaptability" (Harrington, 1991, p. 131). Table 5 shows the twelve cornerstone tools of streamlining, in order of importance, which are also the main activities listed in Table 4.

Table 5 provides an overview of all twelve tools. These tools have proven so useful in improving the efficiency, effectiveness, and adaptability of a process that some of the tools have evolved into entire disciplines; however, BPI views these tools as working best when used in concert (Harrington, 1991). That said, not all these tools must be or can be used in every BPI effort. Each one of these tools is discussed further in this section.

Table 5. The Twelve Cornerstone Tools to Streamlining. Adapted from Harrington (1991).

Tool	Description
Bureaucracy Elimination	Removing unnecessary administrative tasks, approvals, and paperwork.
Duplication Elimination	Removing identical activities that are performed at different parts of the process.
Value-Added Assessment	Evaluating every activity in the business process to determine its contribution to meeting customer requirements.
Simplification	Reducing the complexity of the process.
Process Cycle-Time Reduction	Determining ways to compress cycle time to meet or exceed customer expectations and minimize storage costs.
Error Proofing	Making it difficult to do the activity incorrectly.
Upgrading	Making effective use of capital equipment and the working environment to improve overall performance.
Simple Language	Reducing the complexity of the way we write and talk; making our documents easy to comprehend by all who use them.
Standardization	Selecting a single way of doing an activity and having all employees do the activity that way all the time.
Supplier Partnerships	The output of the process is highly dependent on the quality of the inputs, so looking to improve any supplier inputs.
Big Picture Improvements	When the first 10 tools don't work, this tool can help the PIT drastically change the process.

Automation and/or Mechanization	Applying tools, equipment, and computers to boring, routine activities to free up employees to do more creative activities.

According to Harrington (1991), the most important tool in streamlining is bureaucracy elimination. Harrington states that the "b" in bureaucracy stands for "bad, boring, burdensome, and brutal," emphasizing that bureaucracy stands in stark contrast to streamlining (p. 134). There are many reasons why bureaucracy occurs, and when streamlining a process, the PIT must understand why the bureaucracy exists before deciding whether to eliminate it. Resistance among employees and leadership to eliminating bureaucracy is highly likely, so the PIT should be ready to spend time calculating what the impact of any additional work due to bureaucracy is and help others understand just how much waste is produced by the unnecessary bureaucracy (Harrington, 1991). Only if an organization can demonstrate a sizable return on investment or savings occurring from the bureaucratic activity should that activity within a process be retained (Harrington, 1991).

The next tool is duplication elimination. Duplication of human efforts within a process adds cost, wastes time, and creates the potential for conflicting data (Harrington, 1991). Data integrity is integral to any process and to the competitive advantage of a company. Because of the potential for conflicting data, the process may contain additional steps to ensure data integrity; however, this integrity needs to be built into the process at the point where the data enters the process rather than as an additional step (Harrington, 1991). For example, having a system validate a form before an employee can submit it would reduce any duplication of effort between the employee who filled out the form and the employee in charge of making sure there are no errors on the same form.

Another tool is to eliminate non-value-added time. Value-added assessment (VAA) in its simplest form entails analyzing steps in a process to see if the value a step adds is more than the costs accrued to perform it (Harrington, 1991). There are two types of value-added activities: real-value-added (RVA), which is required to ensure the customer receives the output they are expecting, and business-value-added (BVA), which are activities required by the business for operational or legal purposes but have no value from

the customer's perspective (Harrington, 1991). Non-value-added activities are the opposite of BVA and RVA, meaning they "do not contribute to meeting customer requirements and could be eliminated without degrading…the business process" (Harrington, 1991, p. 140). VAA can measure the cost of business processes using time or employee cost to show cost of a process, while value will need to be defined by the organization.

The next tool is simplification. Simplification means to "reduce complexity wherever feasible," from fewer tasks and interdependencies to streamline methods and trainings (Harrington, 1991, p. 144). Some ways to simplify a process include simplifying complex flows and bottlenecks, using meeting agendas, combining similar activities, eliminating unused data, and refining standard reports (Harrington, 1991). Simplification also includes simplifying the vocabulary of guidance so that all employees can understand what they are being told to do.

Another cornerstone tool of streamlining is process cycle-time reduction. The PIT should first focus on "activities with long real-time cycles and those activities that slow down the process" (Harrington, 1991, p. 147). The team should identify any activities that are performed linearly and determine whether they could be performed in parallel to reduce cycle time. Reducing interruptions by placing critical activities away from high-traffic areas, phones, or computers if possible, as well as improving scheduling of process events, can also lead to a reduced cycle time (Harrington, 1991). Many other efforts performed in the course of streamlining the process will help reduce cycle time as well.

Error-proofing, like cycle-time reduction, can be accomplished in numerous ways. Small changes like using different-colored paper for different outputs and making sure spellcheck is turned on can all help reduce errors. According to Harrington (1991), the number of ways to reduce error is only limited by one's imagination.

Upgrading technology is the next tool. Upgrading means more than just making sure that the equipment involved in the process is current; it also means scrutinizing the technology used within a process to make sure it is the most efficient, effective, and adaptable. For example, making sure that an office is using a template for stamps rather than using a typewriter is one way to consider upgrading, but so is making sure that those who are on the phone often for their job are utilizing headsets to free up their hands. Even

more, the office itself can be considered equipment that is utilized within a process, so changing how the office is set up can help streamline the process (Harrington, 1991).

Another tool for streamlining a process is to ensure the use of simple language. The PIT "needs to evaluate the present documents used in the process to ensure that they are written for the user" (Harrington, 1991, p. 152) and not in technical language that may sound "pompous, wordy, indirect, vague, or complex" (p. 152). The first thing the PIT should do is figure out the comprehension level of the process users, which is influenced by their education level and whether English is their first language (Harrington, 1991). A key part of comprehension is moderating the use of acronyms, technical terms, and abbreviations, which all make comprehension harder for a user. In addition, if a document is more than four pages, Harrington (1991) suggests using a flowchart with detailed annotations to help the reader understand the procedure.

Standardization is another useful streamlining tool. Standardization "is important to ensure that all current and future employees use the best ways to perform activities related to the process" (Harrington, 1991, p. 154). One way to accomplish this standardization is with forms. Forms can help streamline a process, but they must be well-constructed; otherwise, they introduce wasted effort and errors into the process (Harrington, 1991). A form should be clear and should ask for information only once (Harrington, 1991). Having a good form can significantly decrease errors and wasted time in a process. Another form of standardization is documenting procedures. Process owners should document process procedures so that employees understand how to perform a process. These procedures should be easy to understand, should not be open to interpretation, and should define minimum performance standards (Harrington, 1991). Every employee should receive a copy of the procedures and be trained in them, which is the only way an improved process will be of any use (Harrington, 1991).

Addressing supplier partnerships is the next tool addressed in this phase. If any inputs to a process come from an external source (supplier), those that receive that input have "the responsibility to provide the supplier with documented input specifications that define needs and expectations" (Harrington, 1991, p. 155). When streamlining a process, the PIT should make sure that the customer of the inputs, or the executor of the process, is

not asking for more than is necessary from the supplier (Harrington, 1991). Questioning the format in which the input comes into the process is also a good way to streamline a process. For example, if the current process involves a supplier hand-delivering a paper copy of a document to the customer, the process could be streamlined by having the supplier email the customer the document.

Big-picture improvement is a tool that is dedicated to radical changes of a process and can be used when there is "little to gain from further refinement" (Harrington, 1991, p. 156). The PIT can provide big-picture improvements by defining what the flawless process would be "without the constraints of the present organization and/or process" (Harrington, 1991, p. 156). This focus on the perfect process can help the PIT create new concepts, develop new options, and acquire a more refined perspective on the process (Harrington, 1991).

Automation and/or mechanization is the final cornerstone tool of streamlining. According to Harrington (1991), "Don't introduce more sophisticated automation until you thoroughly analyze the strengths and weaknesses of your existing system" (p. 157). He notes that turning a process over to a machine will no doubt increase the speed at which that activity or process is completed; however, "automating a mess just produces a faster mess" (p. 157). When seeking to automate activities, the PIT should look for tasks that are repeated often and would benefit if done quicker and tasks where it would be beneficial if those involved communicated quicker (Harrington, 1991). Essential to this tool is understanding that whatever technology an organization adopts may become obsolete within the next few years. The best way to implement new technology in a process is with pilot projects (Harrington, 1991). If the pilot program receives good reviews from its end users, then the company should begin to run the two programs, the pilot and the existing process, in tandem. Pilot programs allow the employees to feel less stress about the changeover (Harrington, 1991).

D. PHASE IV: MEASUREMENT AND CONTROL

The objective of the next part of BPI is implementing measurements and controls to make sure that the streamlining effort is achieving the desired outcome. Harrington (1991) addresses measurements and controls in Phase IV of his BPI strategy; the objective

and activities for this phase can be seen in Table 6: this phase develops targets, establishes feedback systems, completes audits, and creates a poor-quality cost system.

Table 6. Phase IV of BPI: Objective and Activities. Adapted from Harrington (1991).

Phase IV. Measurements and Controls	
Objective	To implement a system to control the process for ongoing improvement
Activities	Develop in-process measurements and targets
	Establish a feedback system
	Audit the process periodically
	Establish a poor-quality cost system

Lack of measurement is a major obstacle when improving business processes because, if an organization cannot measure an outcome then they cannot control it, and if they cannot control the process then they also cannot manage it (Harrington, 1991). Without an effective feedback system, measurement is a waste of time, effort, and money (Harrington, 1991). Harrington says there are 11 "Ws" of measurement, from "what you should measure" to "who should audit" (Harrington, 1991, p. 165). Each W has an answer for how organizations can communicate why measurement is important to a BPI effort. Overall, measurements are important to improvement efforts for several reasons, including focusing the PIT's attention on factors that achieve the organization's mission, assisting the PIT in setting goals and monitoring trends, and helping the PIT monitor progress of the improvement effort (Harrington, 1991).

There are two types of data that the PIT will be measuring: attributes data and variables data (Harrington, 1991). Attributes data deals with counts, not measures; items with answers such as "yes or no" and "go or no-go" are attributes data (Harrington, 1991). By contrast, variables data is continuous quantitative data quantifying measurements, which provides more detailed information about the output (Harrington, 1991).

Once the measurements show improvement in the newly streamlined process, there are a few steps that the PIT can take to make sure the process keeps any progress in

improvement. First, the PIT can establish standards for the process relating to effectiveness and efficiency and audit the process to make sure the process meets those standards (Harrington, 1991). Next, the process should have a measurement and feedback system to monitor any decrease in efficiency (Harrington, 1991). Finally, by setting business targets for performance, an acceptable performance of the process can be defined. Only the person receiving the output can set these targets. Targets are necessary because expecting to go from a flawed process to perfection is demotivating, so targets allow for small wins.

The main way to control the continuous improvement of the process is by gathering feedback. Feedback and measurement go hand-in-hand. Feedback is subjective information the PIT gets from user of the process on how well the process fits their needs, while measurements provide objective data on how well the process is operating, such as throughput and error rates. An organization should get feedback from the process users on data quality as well as the process itself (Harrington, 1991). To encourage feedback, agencies can establish feedback loops. Harrington (1991) suggests considering the following points: "Relate feedback loops to individuals, make the feedback an obligation, encourage positive and negative feedback, use continuous feedback for continuous improvements, avoid the old proverb 'no news is good news,' encourage customer complaints, and give responsibility to take immediate action" (pp. 184–185). Some ways to get feedback are through audits, self-reporting, and statistical business process controls (Harrington, 1991).

E. PHASE V: CONTINUOUS IMPROVEMENT

Finally, after all the hard work of the first four phases has been completed, the employees may believe that BPI efforts have ceased. However, this is far from the truth. BPI should never really end. The final phase of BPI has on objective to implement continuous improvement (see Table 7). This phase consists of qualifying or certifying the process, eliminating any problems that arise from feedback, measuring the impact of improvement-inducted changes on the business and its customers, and benchmarking current processes (Harrington, 1991).

Table 7. Phase V of BPI Objective and Activities: Continuous Improvement. Adapted from Harrington (1991).

Phase V. Continuous Improvement	
Objective	To implement a continuous improvement process
Activities	Qualify the process
	Perform periodic qualification reviews
	Define and eliminate process problems
	Evaluate the change impact on the business and on the customers
	Benchmark the process
	Provide advanced team training

Companies may choose to certify, also referred to as "qualifying," an activity or an entire process to help garner leadership's attention for processes that have successfully completed a BPI effort. Qualification can motivate employees involved in the BPI process to take the first steps towards continuous improvement (Harrington, 1991). A business process that is eligible for qualification should not only be capable of generating the expected output but also of mass producing that output (Harrington, 1991). Harrington creates a six-level qualification process that can guide BPI activities (see Table 8). Agencies should evaluate different areas of the process to determine if the process has matured to the next qualification level (Harrington, 1991).

Table 8. Six-Level Qualification for BPI Activities. Adapted from Harrington (1991).

LEVEL	STATUS	DESCRIPTION
6	Unknown	Process status has not been determined
5	Understood	Process design is understood and operates according to prescribed documentation
4	Effective	Process is systematically measured, streamlining has started, and end-customer expectations are met
3	Efficient	Process is streamlined and is more efficient
2	Error-free	Process is highly effective and efficient
1	World-class	Process is world-class and continues to improve

All processes should be classified by the PIT as level six until data is gathered by the PIT to examine their true status, at which point they can be qualified as level five. Level four processes "have systematic measurement systems in place and ensures end-customer expectations are met" (Harrington, 1991, p. 209). After streamlining efforts are completed and significant improvement to the process has been shown, a process can receive a level three qualification. Level two processes rarely have problems: customers do not have complaints, schedules are met, and employees involved in the process have low stress levels (Harrington, 1991). Finally, to receive a qualification of level one means that the process is one of the best in the entire world and is often a benchmark process for other organizations.

Benchmarking is another form of continuous improvement, but instead of looking inside the organization conducting the BPI effort for ideas, the PIT begins to look outside. Benchmarking is defined as "the act of systematically defining the best systems, processes, procedures, and practices" (Harrington, 1991, p. 218). The benchmarking process (BMP) should be used for goal setting and process development. A good benchmark should address both the what, like how much a process produces, and the how, as in how the company was able to develop a world-class process (Harrington, 1991). There are four types of benchmarking, but all follow the same six-phase BMP process of design, internal data collection, external data collection, data analysis, process upgrading, and periodic reassessment (Harrington, 1991). Harrington (1991) provides a step-by-step BMP guide that includes 30 activities aimed at creating the internal and external benchmarking process.

Continuous improvement is necessary because the evolution of technology and methods is constant, so processes that include prior versions of both technology and methods need to be updated to maintain their BPI qualification level. Likewise, customers beliefs are evolving both in what they believe the capability of the company should be and expectations on how they should provide the product or service (Harrington, 1991). Ultimately, BPI must have the support of management, good leadership, and continuous improvement for any effort to be successful.

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V. PROCESS ANALYSIS

The next two chapters apply the methodology presented in Chapter IV to improve the CRD process. As was mentioned in Chapter IV, Harrington (1991) explains that his BPI approach should be altered to best fit an organization's "culture, resources, capabilities, and experiences," with a scaled-down version used in a pilot situation (p. 35). With that in mind, Harrington's BPI process is altered within Chapter V and VI to fit within the limits of this project.

This chapter implements all of Phase I and Phase II; both chapters objectively describe the process as it currently is. Phase III, Streamlining, is broken up into three different activities: identifying areas for improvement, providing recommendations for improvement, and prototyping an improved CRD process. Due to its descriptive nature, the first activity in Phase III is discussed in this chapter while the next chapter covers the other two activities in Phase III, as well as Phase IV, Feedback and Measurement, and Phase V, Continuous Improvement.

A. PHASE I: ORGANIZING FOR IMPROVEMENT

Table 2 in Chapter IV shows the activities included in Harrington's Phase I: Organizing for Improvement. Because this effort is an abbreviated version of Harrington's method, only two of the nine original activities are conducted here: appointing a process owner and developing the improvement model. Table 9 shows the modified version of Harrington's five-phase model this research uses to improve the CRD process.

1. Appoint a Process Owner

The author assumes the position of PO and PIT. According to Harrington (1991), processes involving different departments need representatives from those functions during the BPI effort. The CRD process involves only one functional department, the contracting office. With extensive knowledge of the process, the author takes charge of the BPI effort in the same way that the PO and PIT would during a full-scale BPI event.

2. Develop an Improvement Model

Harrington's (1991) BPI model, discussed in the last chapter, was adapted to suit the requirements of this research. Activities not conducted from Harrington's full BPI method fell into one of three categories. First, a step was not included in this project's BPI effort if it was not relevant to or included in the scope of the improvement effort being conducted, such as creating an EIT or communicating goals to employees. Second, if there was not time to conduct the activity, like providing training to the workforce, it was not included in this project. Finally, an activity was not included if the information was not readily accessible, such as collecting cost, time, and value data. Table 9 shows the five-stage BPI model proposed by Harrington modified to fit the CRD process improvement effort conducted in this project. This chapter and the next use this model to improve the CRD process.

Table 9. Harrington's BPI Approach Adapted to CRD Improvement Effort

Phase	Activities
Chapter V: Process Analysis	
Phase I	Appoint process owner
	Develop an improvement model
Phase II	Define the process scope and mission
	Develop a process overview
	Flow diagram the process
	Perform process walkthrough
	Resolve differences
Phase IIIa	Identify improvement opportunities using Streamlining Tools
Chapter VI: Solution Design	
Phase IIIb	Recommendations on how to address improvement opportunities
	Prototype new CRD process
Phase IV	Develop in-process measurements and targets
	Establish a feedback system
Phase V	Qualify the Process
	Benchmark

B. PHASE II: UNDERSTANDING THE PROCESS

Phase II of Harrington's (1991) BPI model's goal is to understand the current process. For this project, this phase includes defining the scope and mission of the process, creating a process overview, flow-diagramming the process, process walkthroughs, and then resolving differences between the prescribed process and the process as it is being performed.

1. Define the Process Scope and Mission

The CRD process is defined in FAR 9.1, so only the activities covered by that section of the FAR are included in this BPI effort. The mission of this process is given in FAR 9.103, Policy, which states:

> (a) Purchases shall be made from, and contracts shall be awarded to, responsible prospective contractors only.
>
> (b) No purchase or award shall be made unless the contracting officer makes an affirmative determination of responsibility. In the absence of information clearly indicating that the prospective contractor is responsible, the contracting officer shall make a determination of nonresponsibility. If the prospective contractor is a small business concern, the contracting officer shall comply with subpart 19.6, Certificates of Competency and Determinations of Responsibility. (If Section 8(a) of the Small Business Act (15 U.S.C.637) applies, see subpart 19.8.)
>
> (c) The award of a contract to a supplier based on lowest evaluated price alone can be false economy if there is subsequent default, late deliveries, or other unsatisfactory performance resulting in additional contractual or administrative costs. While it is important that Government purchases be made at the lowest price, this does not require an award to a supplier solely because that supplier submits the lowest offer. A prospective contractor must affirmatively demonstrate its responsibility, including, when necessary, the responsibility of its proposed subcontractors. (FAR 9.103)

In summary, FAR 9.1 defines the scope of this process, while FAR 9.103 provides the mission of the process.

2. Develop a Process Overview

When developing a process overview, information must be gathered on suppliers, customers, adjacent processes, inputs, and outputs (Harrington, 1991). Suppliers of inputs

to the CRD process are the contractors who supply the proposals; the CO, who gathers information during the process from data sources; and the survey office, which gathers pre-award survey information if requested by the CO. Next, the customer for outputs created by the process is the CO. Significant inputs to the process are the proposal from the contractor, the data the CO gathers, and pre-award survey information, if requested. The only significant output from this process is the determination, which may be documented in a separate form. Some adjacent processes are described in the FAR. FAR 9.1 lists requirements related to conducting a CRD that are accomplished at multiple points during the pre-award process. For example, to find out if FAR 9.1 applies to a particular acquisition, the CO needs to consider FAR 9.1 during market research. Also, while drafting the solicitation, the CO must consider responsibility and which provisions and special standards need to be included.

An overview of the CRD process can be obtained from examining the titles of the sections and subsections within FAR 9.1. Table 10 shows the sections and subsections with their titles; sections are bolded and highlighted with their subsections listed after them. However, looking at just the titles may not provide the best overview of the process. For instance, most CRDs do not utilize pre-award surveys (FAR 9.106) and are not surveys of nonprofit agencies participating in the AbilityOne program (FAR 9.107). Also, the FAR does not present these sections and subsections in the order in which the information is typically used during the CRD and then place it in the appropriate order among the other statements.

Table 10. List of FAR 9.1 Section and Subsection Titles

(Sub)Section	Title
9.100	**Scope of subpart**
9.101	Definitions
9.102	Applicability
9.103	Policy
9.104	**Standards**
9.104-1	General Standards
9.104-2	Special Standards
9.104-3	Application of Standards
9.104-4	Subcontractor Responsibility
9.104-5	Representation and Certifications Regarding Responsibility Matters
9.104-6	Federal Awardee Performance and Integrity Information System
9.104-7	Solicitation Provisions and Contract Clauses
9.105	**Procedures**
9.105-1	Obtaining Information
9.105-2	Determinations and Documentation
9.105-3	Disclosure of Preaward Information
9.106	**Preaward Surveys**
9.106-1	Conditions for Preaward Surveys
9.106-2	Requests for Preaward Surveys
9.106-3	Interagency Preaward Surveys
9.106-4	Reports
9.107	**Surveys of Nonprofit Agencies Participating in the AbilityOne Program**
9.108	**Prohibition on Contracting with Inverted Domestic Corporations**
9.108-1	Definitions
9.108-2	Prohibitions
9.108-3	Representation by the Offeror
9.108-4	Waiver
9.108-5	Solicitation Provision and Contract Clause

(Sub)Section	Title
9.109	**Prohibition on Contracting with an Entity Involved in Activities that Violate Arms Control Treaties or Agreements with the United States**
9.109-1	Authority
9.109-2	Prohibition
9.109-3	Exception
9.109-4	Certification by the Offeror
9.109-5	Solicitation Provision

Another way to provide an overview of a CRD is to categorize steps within the process as either a subprocess, activity, or task. A subprocess consists of activities, which consists of a group of tasks, and tasks, which are single actions or points to be addressed. Separating the CRD process into subprocesses, activities, and tasks helps to manage the pages of guidance set forth in the FAR. Table 11 shows the guidance in FAR 9.1 broken into subprocesses and activities. By grouping tasks into subprocesses and activities, the CRD process can be mapped to a flow diagram (see Figure 8). Blue highlights represent subprocesses, while gold highlights show activities.

Table 11. CRD Subprocesses and Activities as Defined in FAR 9.1

	SUBPROCESS OR ACTIVITY	NAME
1	**Subprocess**	**FAR 9.1 Applicability**
2	**Subprocess**	**Prepare Solicitation**
2a	Activity	Special Standards
2b	Activity	Clauses & Provisions
2c	Activity	Subcontractor Responsibility
3	**Subprocess**	**Select Potential Offeror**
4	**Subprocess**	**Gather Information**
4a	Activity	Preaward Survey
4b	Activity	Affiliated Concerns
4c	Activity	FAPIIS
4d	Activity	Offeror Certifications
5	**Subprocess**	**Responsibility Determination**
5a	Activity	Additional Factors
5b	Activity	Additional Standards
5c	Activity	Main Standards
5d	Activity	Evidence of Contractor Responsibility
5e	Activity	Small Business
6	**Subprocess**	**Responsible Contractor**
7	**Subprocess**	**Nonresponsible Contractor**

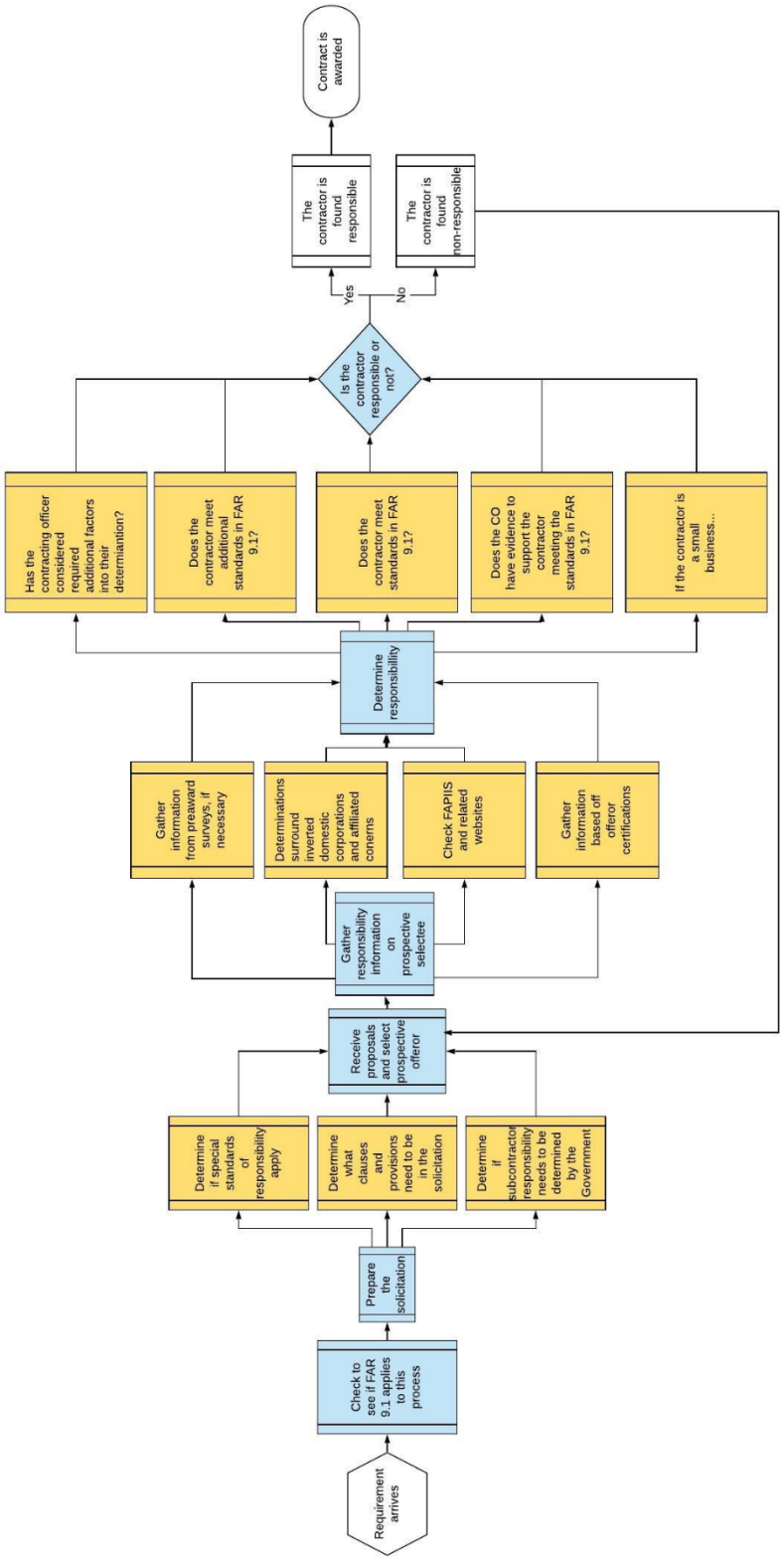

Figure 8. FAR 9.1 CRD Process Overview

3. Flow Diagram the Process

To create a flow diagram of the *entire* process listed in FAR 9.1, each sentence of the subpart must be analyzed to determine where it fits into the CRD process sequence as well as which subprocess and activity the task belongs to. Figure 9 shows a high-level overview of every subprocess, activity, and task listed in FAR 9.1. In total, there are seven subprocesses, 12 activities, and 354 tasks. While Figure 8 captured the FAR 9.1 requirements at the level of subprocesses and activities listed in Table 11, this figure provides the reader a detailed view of the structure of the CRD process. Each subprocess and activity is further charted in Appendix C.

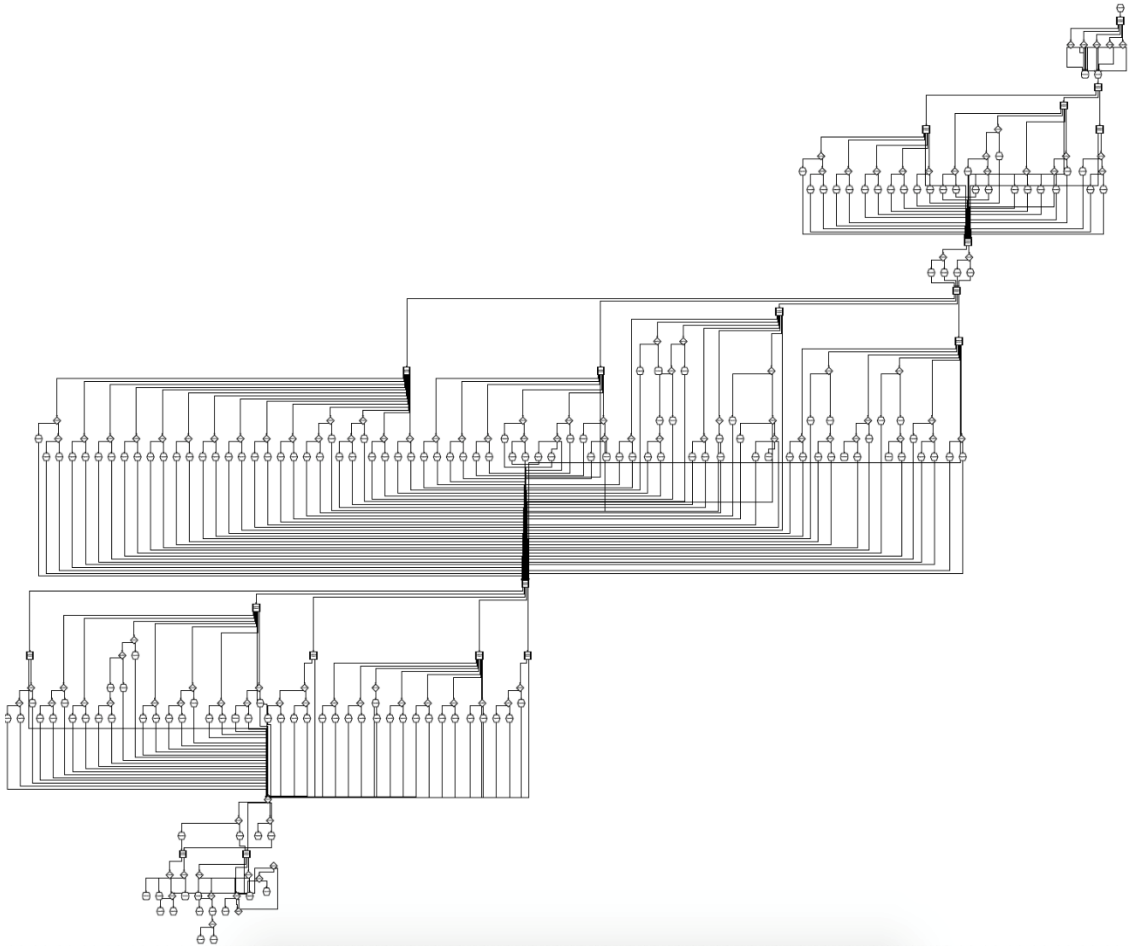

Figure 9. FAR 9.1 CRD Process: Subprocess, Activities, and Tasks

4. Process Walkthroughs

While the overviews help capture what the prescribed process is within the FAR, the actual process must be captured through process walkthroughs. As Harrington indicates, process walkthroughs are necessary to see how a process is actually being performed versus how the process is detailed in a guide or standard operating procedure (Harrington, 1991). To obtain a representative sample of data on how the CRD process is currently conducted, I interviewed two groups of Naval Postgraduate School Master of Business Administration students who are also Air Force contracting officers—a total of 25 people interviewed. On average, these officers had over two years of operational contracting experience. Operational contracting units within the Air Force execute the majority of contracts for the Air Force, which means that these officers have significant experience with CRDs on which they could draw on to answer the interview questions. These interviews used a questionnaire (see Appendix A) to guide the interviews so that each interviewee was providing information in response to the same questions. The three main questions were as follows:

> Question 1: What is the current process to find a contractor responsible?
>
> Question 2: What are some critiques to the following flowchart in terms of how it reflects the current process and if it is compliant with the current regulations for CRDs?
>
> Question 3: If available to Contracting Officers, what additional data sources, resources in general, or processes could be utilized to improve the current contractor responsibility process?

These interviews allowed the PO to gather the information that would have been gathered on a traditional process walkthrough. Overall, the interview walkthroughs showed varied experiences with the CRD process across the officers' careers. Each of the interviewees explained that every unit they were with had a different process from their previous unit for conducting a CRD, and they believed this to be the case for most contracting personnel. The most common variations on the CRD process derived from the interviews are shown in Figures 10, 11, and 12.

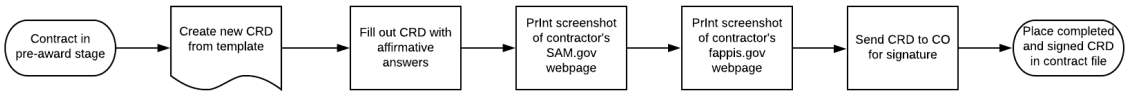

Figure 10. Current CRD Process: Variant 1

Figure 11. Current CRD Process: Variant 2

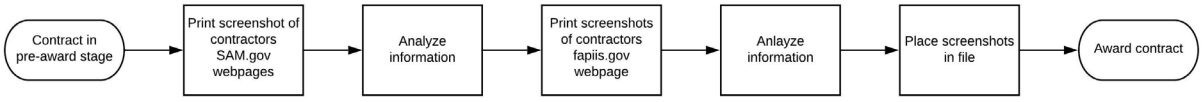

Figure 12. Current CRD Process: Variant 3

These variants are not an exhaustive list of the all the different variations on the current process but were the most common ones described in the interviews. The CRD variants differed in two major areas: documentation and data gathering. Some agencies require documentation of the CRD through a standardized form; others do not and consider the signing of the contract to be enough. However, other documentation requirements are different among organizations as well. Some organizations require just a screenshot of FAPIIS, while other organizations require screenshots of both the SAM and FAPIIS websites. Appendix B includes five different templates used to document the CRD within the AF.

Regarding data gathering, the FAR provides a list of additional sources that the CO can use to support their determinations, such as past performance information, bid or proposal information, commercial sources of supplier information, preaward surveys, and other sources like financial institutions and business and trade associations (FAR 9.1). However, many COs explained that the CRDs they had conducted mostly used SAM and FAPIIS as the primary data sources.

5. Resolving the Differences

Based on the interviews and the CRD templates gathered, I created the following tables to illustrate the differences between the current process as it is performed compared to the CRD process prescribed in the FAR. Table 12 maps the five AF CRD templates in Appendix B to the FAR 9.104 CRD requirements to show what standards these templates document. Green indicates that the template does include a place to address the standard while red indicated that it does not address the standard.

Table 12. AF CRD Templates Mapped to FAR 9.104 Requirements

FAR 9.104	(a)	(b)	(c)	(d)	(e)	(f)	(g)
Template 1							
Template 2							
Template 3							
Template 4							
Template 5							

In addition, preliminary interviews with contracting personnel revealed that two main websites were checked during a CRD: SAM and FAPIIS. Table 13 shows what information each website provides regarding the seven standards in FAR 9.104 to establish the extent to which these websites are able to provide the information required to be gathered by the FAR. Same as above, red means that the website does not include data related to the standard and green means it does. The third color, yellow, means that the website may include information related to the standard, but does it is not objectively related enough to deserve a green fill.

Table 13. Two Main CRD Websites' Data Mapped to FAR 9.104 Requirements

FAR 9.104	(a)	(b)	(c)	(d)	(e)	(f)	(g)
SAM							
FAPIIS							

To further resolve the differences between the current process as described by AF COs and the requirements in FAR 9.1, it is necessary to review the additional tasks the

FAR requires of COs beyond making sure that the prospective contractor meets the seven standards. Like the previous two tables, Tables 14 and 15 map the information from the AF CRD templates and the two websites (SAM and FAPIIS) to some of the additional requirements in FAR 9.1.

Table 14. AF CRD Templates Mapped to Additional FAR 9.1 Requirements

FAR 9	.104-2	.104-3(b)	.104-3(c)	.104-3(d)	.105-1(c)(5)	.106
Template 1						
Template 2						
Template 3						
Template 4						
Template 5						

Table 15. Two Main CRD Websites' Data Mapped to Additional FAR 9.1 Requirements

FAR 9	.104-2	.104-3(b)	.104-3(c)	.104-3(d)	.105-1(c)(5)	.106
SAM						
FAPIIS						

As the process walkthrough interviews reveled, the CRD process is accomplished through a variety of methods. Figures 10, 11, and 12 provide examples. However, no documentation currently shows how these variations of the process are or are not meeting all the requirements set forth in FAR 9.1. As Tables 13 and 15 indicate, simply taking screenshots of the SAM and FAPIIS websites as many COs currently do is not enough to meet the requirements in FAR 9.1. Table 16 details which FAR 9.1 requirements the current variations detailed in Figure 10, 11, and 12 meet by using Table 11's subprocesses and activities for an abbreviated comparison. A green cell means that the variation does include a way to complete the subprocess or activity, while a red cell means the variation does not include a way to complete that subprocess or activity.

Table 16. Current CRD Process Variations Mapped to FAR 9.1 Subprocess and Activities

	SUBPROCESS OR ACTIVITY	Current CRD Process #1	Current CRD Process #2	Current CRD Process #3
1	**FAR 9.1 Applicability**			
2	**Prep Solicitation**			
2a	Special Standards			
2b	Clauses & Provisions			
2c	Subcontractor Responsibility			
3	**Select Potential Offeror**			
4	**Gather Information**			
4a	Preaward Survey			
4b	IDC and AC			
4c	FAPIIS			
4d	Offeror Certs			
5	**Responsibility Determination**			
5a	Additional Factors			
5b	Additional Standards			
5c	Main Standards			
5d	Evidence of CR			
6	**Small Business**			
7	**Responsible Contractor**			

Having finished with the first two phases of the altered BPI model which focus on setting up the BPI effort and creating a process overview, Phase III begins the actual act of improvement of the CRD process.

C. PHASE III: STREAMLINING (ACTIVITY 1)

The first activity within the streamlining phase is to identify areas for improvement. By using the streamlining tools that Harrington (1991) prescribes, multiple areas for improvement can be identified. As with Phase I and II, Phase III has been altered to better fit the requirements of this research.

1. Identifying Unnecessary Bureaucracy

It is unclear how much of FAR 9.1 is unnecessary bureaucracy. There is no single repository that documents how a FAR part has changed over time, meaning there is no direct mechanism to measure whether FAR 9.1 contains unnecessary regulations. The Federal Register does capture changes that have been added to the FAR, but this information is not available in a single database. Even with that being the case, Harrington (1991) provides questions that can help to identify bureaucracy within this process.

a. Are There Unnecessary Checks and Balances?

No. The basis of a CRD is that a CO gathers enough information to deem a contractor responsible. This standard means that absence of negative information is not enough to name a contractor responsible; there must be affirmative information indicating responsibility. The two main sources of information on a contractor are SAM and FAPIIS. The contractor is required to supply information in SAM that is self-certified, and FAPIIS uses information that has been submitted from other COs who have made nonresponsibility determinations. Neither of these sources of information is required to be checked prior to the CO using the information in their determination. In regard to the "balance" side of checks and balances, there is no balance of power for the CRD process, since the CO has ultimate authority to decide if a contractor is responsible.

b. Does the Activity Inspect or Approve Someone Else's Work?

Outcome dependent. When evaluating small businesses, COs are required to defer a determination of nonresponsibility until they confer with the Small Business Administration (SBA), which has ultimate authority in designating a small business (SB) responsible or not. The SBA must "approve" the CO's finding of potential nonresponsibility; however, if the SBA does not agree with the CO, it can issue a certificate of competency (COC) and overrule the CO.

c. Does it Require More Than One Person's Signature?

No. Only the CO is required to sign any contract or documentation related to a CRD.

d. Does it Require Multiple Signatures from the Same Party?

Varies by organization. Per the FAR, only the CO's signature is required when a contractor is found responsible, and that signature is on the contract. Some agencies and organizations do require an additional form to be filled out by the CO when a contractor is found responsible. If a contractor is found not responsible, then the CO is always required to fill out documentation on how they came to this determination.

e. Are Multiple Copies Required?

Outcome dependent. Only one copy of each type of documentation is necessary when a contractor is found responsible. However, when a contractor is found not responsible, a CO must document both in the file and in FAPIIS why the contractor received this determination.

f. Are Copies Stored for No Apparent Reason?

Varies by organization. Not all agencies have moved to solely digital files, and some who even still have only paper files.

g. Are Copies Sent to People Who Do Not Need the Information?

No. Only the CO is required to view the information to determine a prospective contractor responsible. For a CO to determine a contractor not responsible, the CO must log the information and reasoning in FAPIIS, which assists other COs in making responsibility determinations. This information can be viewed by other COs looking to make a responsibility determination on the same company.

h. Are There People or Agencies Involved That Impede the Effectiveness and Efficiency of the Process?

Yes. As mentioned previously, the SBA's involvement occurs after a CO has already found evidence that a prospective contractor is not responsible. In such an outcome, work is duplicated which presents a potential opportunity to increase efficiency.

i. Is there Unnecessary Written Correspondence?

Yes. At the FAR level, the CO is required to document how the information from FAPIIS was used in the responsibility determination. FAR 9.104-6(d) states, "The contracting officer shall document the contract file for each contract in excess of the simplified acquisition threshold to indicate how the information in FAPIIS was considered in any responsibility determination, as well as the action that was taken as a result of the information" (FAR 9.104, 2020). However, FAR 9.105-2(a)(1) states, "The contracting officer's signing of a contract constitutes a determination that the prospective contractor is responsible with respect to that contract" (FAR 9.105, 2020). If a CO's signature is sufficient justification for a determination of responsibility, then requiring the CO to provide "documents and reports supporting … the use of FAPIIS information" is unnecessary (FAR 9.105-2, 2020).

j. Do Existing Organizational Procedures Regularly Impede the Efficient, Effective, and Timely Performance of Duties?

No. It does not seem from a review of the process that any of the CRD procedures place an undue burden on the CO.

k. Is Someone Approving Something They Have Already Approved?

Yes. During LPTA source selections, past performance may be included as evidence of technical acceptability. When past performance is included in LPTA source selections, the CO is using a satisfactory/unsatisfactory scale on past performance. This is the same scale that will be used during the CRD process once the CO is ready to award the contract.

2. Identify Complexities in the Process

One area of complexity is the use of multiple data sources to conduct a CRD. As stated previously, FAPIIS was supposed to be a "one-stop shop" for CRDs, but COs must go to SAM for at least some of the required information—for instance, to know if a contractor is debarred or suspended, what representations and certifications the company has made, and contact information. Furthermore, these two websites do not provide data that clearly supports the seven responsibility standards as shown in Table 13. The need to

access multiple data sources also causes task fragmentation—"a break in continuous work activity" (Mark et al., 2005).

Another area of complexity in the CRD process is the required documentation of how the CO used the information in FAPIIS. It is unclear what type of documentation would meet the requirement of FAR 9.105-2(b)(1), which states, "Documents and reports supporting a determination of responsibility or nonresponsibility, including any preaward survey reports, the use of FAPIIS information (see 9.104-6), and any applicable Certificate of Competency, must be included in the contract file." Currently, according to the process walkthroughs, some COs are using screenshots of SAM and FAPIIS to satisfy this requirement, while others are using formal documentation.

3. Identify Added Process Time

None of the COs interviewed had encountered a single system in which to conduct all their official business. COs use many different systems, including a contract writing system (CWS), different databases (like SAM and FAPIIS), document editors (like Word and Adobe Acrobat), and communication systems (like Outlook). Even when conducting the newest variation of the CRD process—the process using bots to gather CRD information—the CO must email the bot, wait until the bot returns the documents, open a document editor to complete the documentation, and then sort and file the documents in a digital filing system. The use of all these different systems adds additional process time.

4. Identify Areas for Mistakes

An error can occur in the CRD process when the CO does not perform required activities or tasks per FAR 9.1. Currently, there is no way of tracking whether all the requirements in FAR 9.1 are being accomplished as the CRD is being completed. Some agencies conduct internal reviews that retroactively inspect files, with one inspection area being the CRD.

5. Identify Areas That Are Unstandardized

Every CO may require different levels of information to feel they have reasonable evidence to determine a contractor responsible, so requiring the CO to look only at certain

sites for information would take that discretion away from the CO. However, because of the vague phrasing in the FAR surrounding required documentation during a determination of responsibility, there is a lack of standardization regarding documentation. Here again, different agencies and organizations believe screenshots of the websites they use are enough, while others believe an additional determination form is required.

6. Identify Areas for New Technology

The first area that offers significant opportunity to implement new technology is a CWS. Currently, many USG agencies are utilizing CWSs that are strictly for writing contracts, with little to no interaction with outside databases or additional functionalities. Another area in which new technology could be utilized is the gathering of data. There are many ways that technology can help with gathering data, specifically data that is publicly available on the internet. Additional public data sources can provide the CO with more relevant information when making a CRD. Finally, another area for new technology is the evaluation of the data. Even with access to more data, the CO has limited time to conduct a CRD. New technologies can help sift through data and evaluate what data is relevant for the CO to view prior to making a responsibility determination.

The next chapter continues Phase III by taking the areas for improvement identified in this chapter and proposing solutions for those issues.

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VI. SOLUTION DESIGN

After identifying issues within the CRD process that cause it to be ineffective, inefficient, and not adaptable, the next half of the BPI phases focus on working towards an improved process. This chapter starts by going through the issues identified in the last chapter and proposes solutions that will address those issues while increasing the efficiency, effectiveness, and adaptability of the CRD process.

A. PHASE III: STREAMLINING (ACTIVITIES 2 AND 3)

Table 5 in Chapter IV provides a list of the cornerstone tools to any BPI effort. This section goes through the applicable tools to this effort to identify areas where the CRD process can be improved to be more effective, efficient, and adaptable. At the end of each streamlining tool, a chart lists the different areas that have been identified in that section for improvement.

1. Recommendations for Improvement

After flowcharting the process based on how it is performed by employees (see Figure 10, 11, and 12) and how it is required to be performed by the FAR (see Figure 8 and Figure 9), the main two areas that need to be improved deal with making sure the process meets all the requirements in the FAR and creating an efficient and standardized process. Combining all the issues found throughout Activity 1 in the last chapter, Table 17 shows what an improved CRD process could address.

Table 17. Streamlining Areas of Improvement

Process Improvement Areas	Description
Eliminate bureaucracy	Reduce the amount of guidance in the FAR and supplemental sections.
Address all requirements in FAR 9.1	Design a process that meets all seven standards in FAR 9.104 as well as additional requirements in FAR 9.1.
Role of the SBA	Determine who should have sole responsibility of CRDs for SBs to reduce duplicative work.
Standardize Documentation Required	Documentation of a CRD across agencies should be standardized to reduce inefficiencies and help a single process be adopted.
Require Digital Documentation	Use of paper files is highly inefficient due to use of additional resources and inability to access files from any location. Digital documentation should be required for any new process.
Bring CRD process into the CWS	Bringing the CRD process into the CO's current workflow reduces inefficiencies and errors.
Automate the CRD process	Automation of the CRD process will allow for the CO's time to be spent on the critical thinking of determining if the information gathered shows a responsible contractor versus spent on gathering the information.

a. Eliminate Bureaucracy

Though eliminating bureaucracy can be a lengthy process, it is worth delving into so agencies are aware of areas within the FAR they could petition to be changed to reduce the bureaucracy related to the CRD requirement and to identify the areas of bureaucracy not directly related to the FAR guidance that could be eliminated. One way to eliminate some bureaucracy in the CRD process relates to documenting how FAPIIS was used. The FAR needs to be clarified, either through amending the FAR or adding information to the different supplements, on whether screenshots of the data are sufficient to meet the intent of showing how FAPIIS was used, which is a requirement in FAR 9.1.

b. Address all Requirements in FAR 9.1

One way to make sure that all FAR requirements are fulfilled while also simplifying the process is to create a single interface that offers all the required information set forth in FAR 9.1. Adding additional requirements in FAR 9.1 has occurred over time, but FAPIIS, supposedly the USG's main website for responsibility information, has not caught up. If there was a single location for the required information to be viewed by a CO, this would remove fragmentation of the CRD process due to the CO having to go to at least two different sites to complete a CRD.

Another way to make sure all FAR requirements are addressed is by making sure to use simple language in any of the formal documentation necessary to conduct a process. Though FAR 9.1 does not include much technical language, it does include many statements that are unclear in intent, and the information is not presented in a chronological or linear manner that enables someone to easily follow the process.

c. Eliminate Duplicative Work of the Small Business Administration

The SBA has overriding authority on a CO's determination of non-responsibility. Accordingly, one possible mechanism for eliminating the duplication of work that the CO has already performed would be for the SBA to assume this task in all cases and provide the information to the CO. Another possibility would be for the SBA to receive and use the documentation that the CO has already compiled as a starting point for their review. A third possibility would be for to place the onus of requesting a COC appeal on the SB rather than it being an automatically triggered part of the process.

d. Standardize Required Documentation

One way to improve efficiency in the CRD process is to is to clarify and standardize what documentation is required for a responsibility determination. Currently, some agencies require a formal document explaining how the determination was made, even though this is not required in the FAR. If this is a best practice, then it should be standardized across the entire federal government.

e. Require Digital Documentation

Another way to increase efficiency is through the mandatory use of digital files with no paper copies. Though this is already required, any agency wanting to improve the CRD process will also need to only use digital files to gain the full benefits of an improved CRD process

f. Migrate the CRD Process into the CWS

The best way to reduce process time is to get the CRD process into the CO's current workflow when writing a contract, which would mean allowing the CO to conduct the CRD while in their contract writing system. This would reduce all additional time a CO uses to access additional websites. Also, any documentation can be programmed to occur instantly upon finding a contractor responsible. Putting all the information for the CRD on a single page within the CWS reduces process time by making serial activities into parallel activities.

To incorporate the CRD process into a CO's workflow, agencies must invest in a more modern CWS. For agencies not already using a CWS that can link to external APIs and a digital file system, these agencies need to upgrade their equipment. Legacy CWSs were created to help employees write digital contracts, but not much more. Modern CWSs have been developed with the understanding that COs must accomplish much more than writing a contract and utilizing the same system for multiple actions is beneficial. Even if an agency does not incorporate CRD into its CWS's organic environment, a contractor or government agency could create a webpage that different agencies' CWSs could access through an API so that the information still appears within their workflow. A CWS linking to digital files would reduce process time for any required documentation.

Some federal organizations already have CWSs that are web-based and allow for micro-services to be used within the system. Once such system is the AF's CON-IT. However, the AF and other agencies already have some innovative tools to help COs make their many decisions; the difficulty is in getting the COs to use these tools. If a new CRD process was created, then it should be able to be accessed through CWSs, either through direct integration or an API. Not only does incorporating a CRD into a CWS help to save

paper, since some units are still not completely digital, but it also saves even more time since the user will not have to exit one system, log in to another, navigate to what they want to print, and print it. For agencies that have their digital filing system connected to their CWS, like the Army, they can go one step further, and once the CO completes the CRD, it can automatically file the documentation in the digital filing system for them.

g. Automate the CRD Process

Based on all the streamlining processes gone through so far, there seems to be seven levels of automation that could be implemented to improve the CRD process. Figure 13 illustrates these different levels. Currently, the CRD process is seeing automation in the first level using bots, as discussed previously. The next level of automation would be to gather the same information from SAM and FAPIIS but restructure it so that it is much easier to digest and find then screenshots of the website, and eventually another step would be to add Federal Procurement Data System (FPDS) data. FPDS is the main source for all federal contracting data and is publicly available. After FPDS, SAM, and FAPIIS are included in the new automated process with APIs, any other publicly available data sources should also be utilized or at least offered as an option for the CO to use. Publicly available information is easier information to access, and there are fewer rules regulating its use. A great source of performance data is the Contractor Performance Assessment Rating System, or CPARS. However, CPARS is not publicly available and is considered source selection sensitive information, so access is more restricted and more difficult to retrieve.

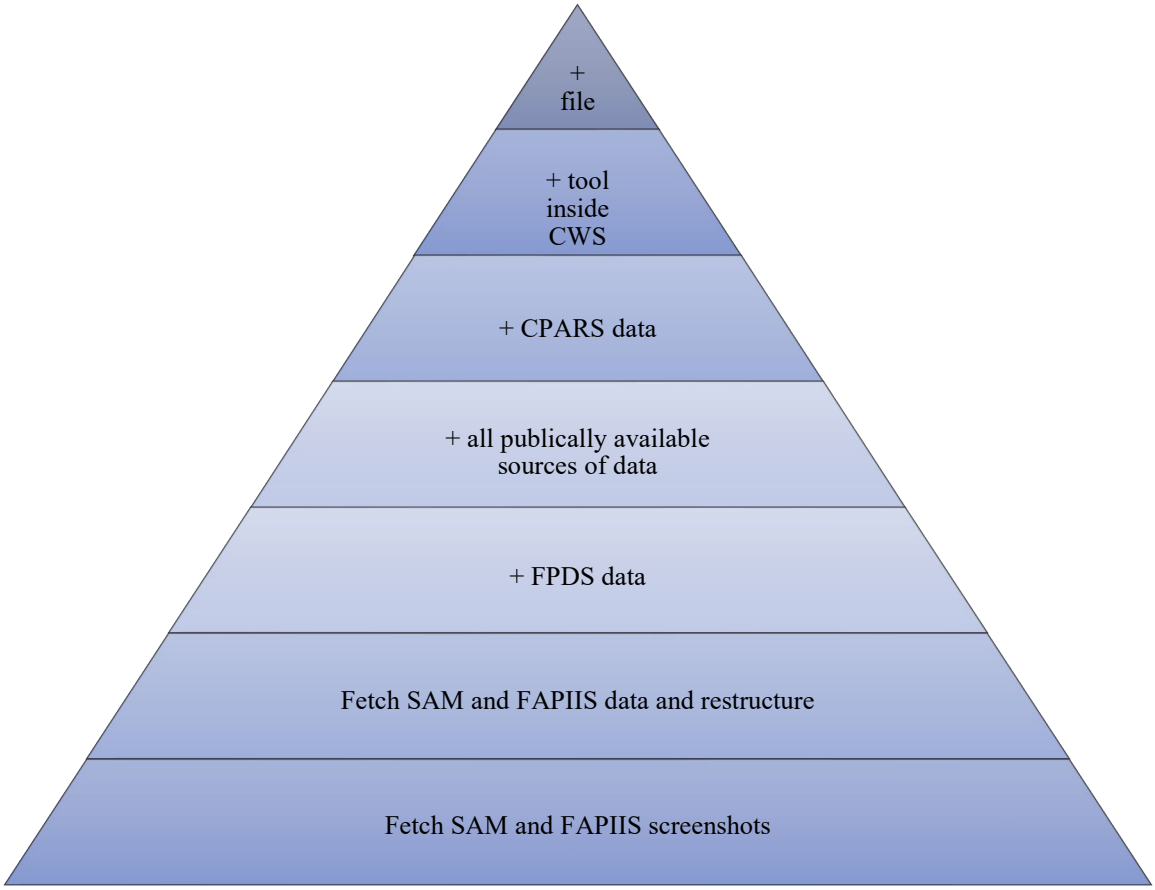
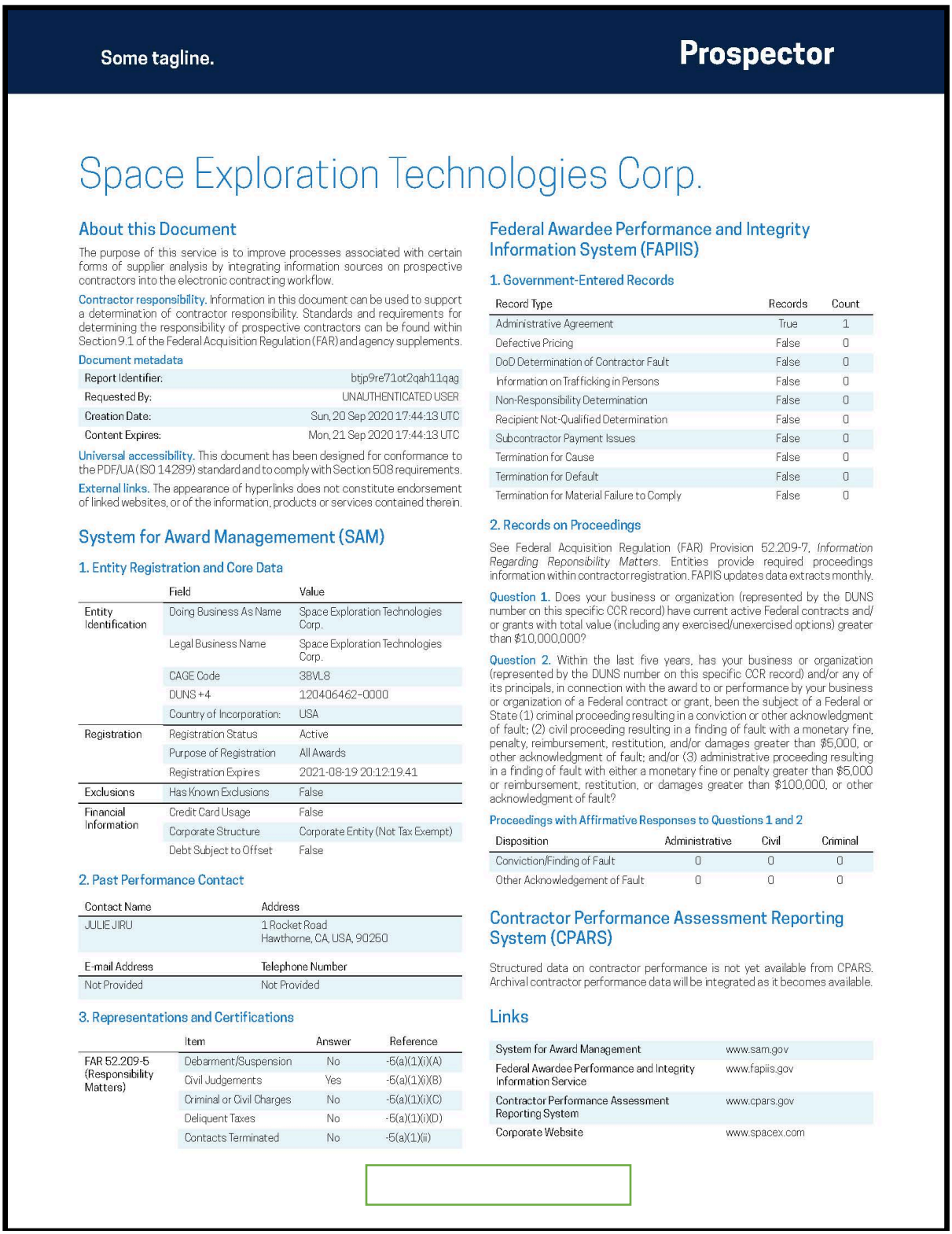


Figure 13. Automation Hierarchy for the CRD Process

2. Prototyping the Improved CRD Process

Along with my advisor, Lieutenant Colonel William Muir, and I developed a prototype based on the areas of improvement found in Phases I through IV. This prototype only begins the process of improvement for the CRD process. All the different improvement efforts are discussed next. Figure 14 shows an image of the prototype.



Some tagline.

Prospector

Space Exploration Technologies Corp.

About this Document

The purpose of this service is to improve processes associated with certain forms of supplier analysis by integrating information sources on prospective contractors into the electronic contracting workflow.

Contractor responsibility. Information in this document can be used to support a determination of contractor responsibility. Standards and requirements for determining the responsibility of prospective contractors can be found within Section 9.1 of the Federal Acquisition Regulation (FAR) and agency supplements.

Document metadata

Report Identifier:	btjp9re71ot2qah11qag
Requested By:	UNAUTHENTICATED USER
Creation Date:	Sun, 20 Sep 2020 17:44:13 UTC
Content Expires:	Mon, 21 Sep 2020 17:44:13 UTC

Universal accessibility. This document has been designed for conformance to the PDF/UA (ISO 14289) standard and to comply with Section 508 requirements.

External links. The appearance of hyperlinks does not constitute endorsement of linked websites, or of the information, products or services contained therein.

System for Award Managemement (SAM)

1. Entity Registration and Core Data

	Field	Value
Entity Identification	Doing Business As Name	Space Exploration Technologies Corp.
	Legal Business Name	Space Exploration Technologies Corp.
	CAGE Code	3BVL8
	DUNS +4	120406462-0000
	Country of Incorporation:	USA
Registration	Registration Status	Active
	Purpose of Registration	All Awards
	Registration Expires	2021-08-19 20:12:19.41
Exclusions	Has Known Exclusions	False
Financial Information	Credit Card Usage	False
	Corporate Structure	Corporate Entity (Not Tax Exempt)
	Debt Subject to Offset	False

2. Past Performance Contact

Contact Name	Address
JULIE JIRU	1 Rocket Road Hawthorne, CA, USA, 90250

E-mail Address	Telephone Number
Not Provided	Not Provided

3. Representations and Certifications

	Item	Answer	Reference
FAR 52.209-5 (Responsibility Matters)	Debarment/Suspension	No	-5(a)(1)(i)(A)
	Civil Judgements	Yes	-5(a)(1)(i)(B)
	Criminal or Civil Charges	No	-5(a)(1)(i)(C)
	Deliquent Taxes	No	-5(a)(1)(i)(D)
	Contacts Terminated	No	-5(a)(1)(ii)

Federal Awardee Performance and Integrity Information System (FAPIIS)

1. Government-Entered Records

Record Type	Records	Count
Administrative Agreement	True	1
Defective Pricing	False	0
DoD Determination of Contractor Fault	False	0
Information on Trafficking in Persons	False	0
Non-Responsibility Determination	False	0
Recipient Not-Qualified Determination	False	0
Subcontractor Payment Issues	False	0
Termination for Cause	False	0
Termination for Default	False	0
Termination for Material Failure to Comply	False	0

2. Records on Proceedings

See Federal Acquisition Regulation (FAR) Provision 52.209-7, *Information Regarding Reponsibility Matters*. Entities provide required proceedings information within contractor registration. FAPIIS updates data extracts monthly.

Question 1. Does your business or organization (represented by the DUNS number on this specific CCR record) have current active Federal contracts and/or grants with total value (including any exercised/unexercised options) greater than $10,000,000?

Question 2. Within the last five years, has your business or organization (represented by the DUNS number on this specific CCR record) and/or any of its principals, in connection with the award to or performance by your business or organization of a Federal contract or grant, been the subject of a Federal or State (1) criminal proceeding resulting in a conviction or other acknowledgment of fault; (2) civil proceeding resulting in a finding of fault with a monetary fine, penalty, reimbursement, restitution, and/or damages greater than $5,000, or other acknowledgment of fault; and/or (3) administrative proceeding resulting in a finding of fault with either a monetary fine or penalty greater than $5,000 or reimbursement, restitution, or damages greater than $100,000, or other acknowledgment of fault?

Proceedings with Affirmative Responses to Questions 1 and 2

Disposition	Administrative	Civil	Criminal
Conviction/Finding of Fault	0	0	0
Other Acknowledgement of Fault	0	0	0

Contractor Performance Assessment Reporting System (CPARS)

Structured data on contractor performance is not yet available from CPARS. Archival contractor performance data will be integrated as it becomes available.

Links

System for Award Management	www.sam.gov
Federal Awardee Performance and Integrity Information Service	www.fapiis.gov
Contractor Performance Assessment Reporting System	www.cpars.gov
Corporate Website	www.spacex.com

Figure 14. CRD Improved Process: A Contractor Prospectus

To begin, the issue of the need to access multiple websites or systems is addressed. The CRD process as executed requires the CO to go to at least SAM and FAPIIS, and the bots developed by different federal organizations still require the CO to scan multiple documents to find the required information since they take screenshots of the individual websites' different pages. The prototype addresses this issue by accessing the two required websites through API keys rather than through the customer-facing interface. Not only does this provide the information to the CO in a single document, but it also prevents issues that come from any changes occurring on the webpages. When a webpage changes, tools like text scrapping, something the determination of responsibility automation, or DORA, bot uses, can bring more hassle than benefit because they must be constantly updated with each change that occurs to the webpage. An API, however, does not deal with the human interface part of a website, so changes to a webpage rarely affect the API. All this information is reformatted and produced on a PDF document. Table 18 shows the data sources the current process and the bot process gather versus what the prototype is currently gathering. Like the other tables, green indicates that the data is gathered during the process while red mean it is not.

Table 18. Current Processes vs. Prototype Processes Information

	Current Process	"Bot" Process	Prototype Process
SAM			
FAPIIS			
Commercial Sources			

By utilizing APIs to access the websites that the CO can use to make a determination, two improvement areas are addressed. First, the CRD process begins to become automated. Instead of the CO having to access each webpage themselves, print or document the information on the websites, and then make the determination, now the CO just must go to a single source for all their information and make the determination. The second improvement area is moving the CRD process into the CWS. Though this prototype is not inside a CWS, it was coded so that a CWS could access it through a micro-service.

The only reason a website was created was so that feedback could be gathered on the prototype prior to it getting adopted into a CWS. Future versions of the prototype should focus on getting this CRD process into the CWS because this is the most efficient way to conduct the CRD.

The prototype also helps address the issue of standardization. Even if COs are taking screenshots of the SAM and FAPIIS websites, due to the SAM website's layout, there could be information included in some screenshots that are not in others. By pulling the information to a single document via API, the prototype helps to standardize what information is documented for each CRD.

B. PHASE IV: MEASUREMENTS AND FEEDBACK

The next phase is measurements and feedback. Measurements will be tracked once the prototype is integrated into the CWS, but feedback was gathered as soon as the prototype was operational.

1. Develop In-Process Measurements

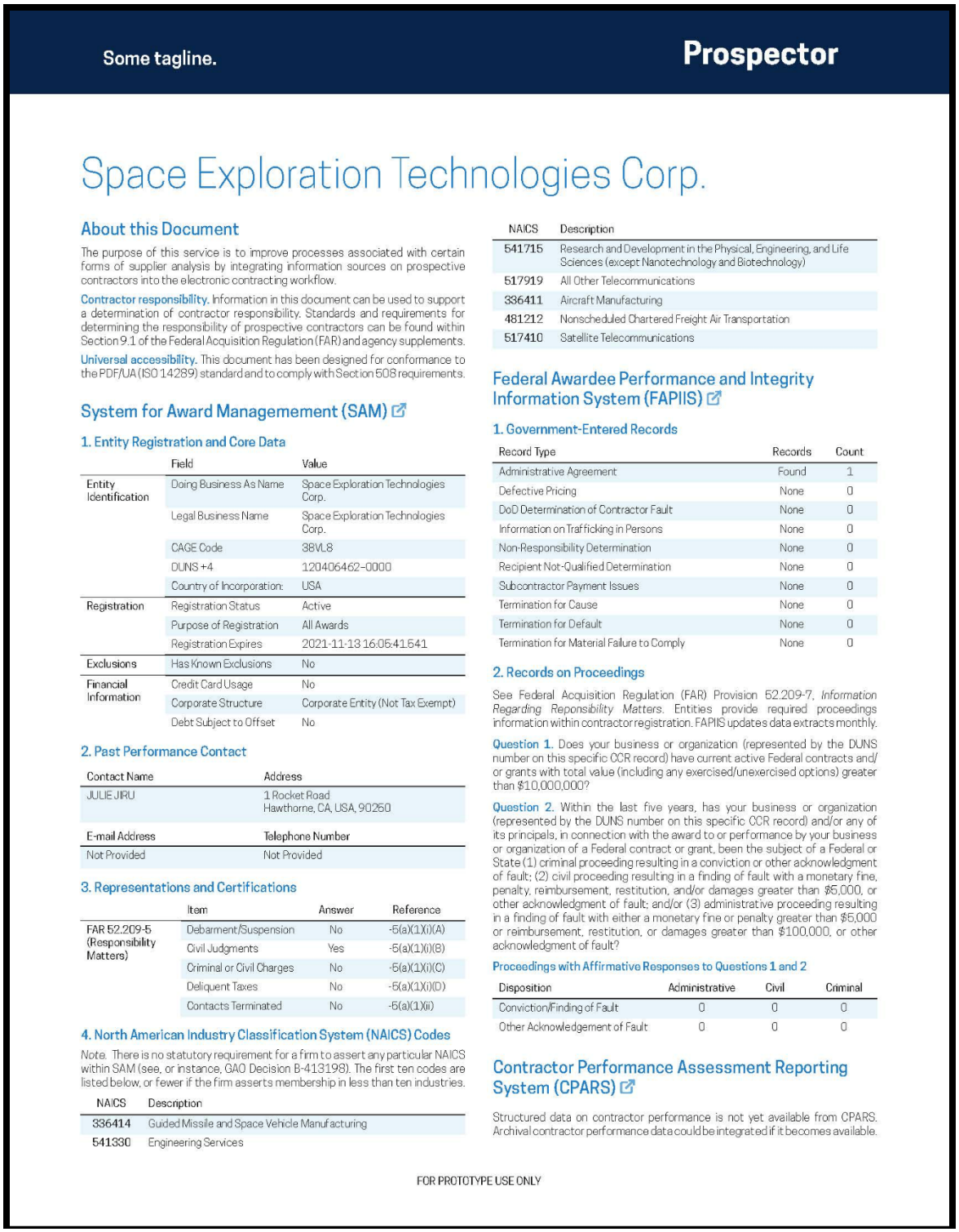
Currently, it is difficult to track CRDs. Besides tracking individuals conducting a CRD, there is no data on how long an average CRD takes, how long a CRD takes for different types of contracts, or the major roadblocks in performing a CRD. The only data captured is FAPIIS showing when a contractor is found not responsible, and since a contractor must be found responsible prior to award of a contract, the number of responsible contractors is equal to the number of contracts awarded to that contractor. Whether conducted via an external webpage or internal to a CWS, the system should track measurements on responsibility. If agencies track their own information, it allows for another source of information that COs could utilize when conducting a CRD. For example, if a CO within the AF finds a contractor not responsible on Monday and the CWS tracks this internally, when a CO on Tuesday wants to award to that same contractor, the CWS can warn the second CO that the contractor was found not responsible prior to it being officially put into the FAPIIS system.

2. Establish a Feedback System

COs' feedback on the improvement of any process is necessary. One reason that FAPIIS has lagged in continuing to be a one-stop shop for CRDs could be attributed to the fact that there is no feedback system on the website. However, if an agency chooses to streamline the process, feedback must be a part of that plan. If the agency is going to incorporate the CRD into the CWS, then the CWS page that includes the CRD on it needs to have a feedback button that any CO can use to instantly provide feedback during a CRD. The leadership should also request that occasional requests for feedback are sent out to the COs automatically.

After producing a working protype, my advisor built a webpage so users would have easy access to the prototype and the ability to provide requested feedback. The main webpage (https://www.lunella.io) was created as a place to store any future tools while soliciting feedback, while the prototype's specific page (https://www.lunella.io/post/prospectus/) provides ample background knowledge on the project, the current and future plans for the prototype, and an area requesting feedback from any visitors.

This link was sent to approximately 50 individuals, with eleven individuals providing feedback in accordance with the questions listed on the webpage. Based on the feedback presented, changes were made to the prototype. Figure 15 and Figure 16 shows the updated prospectus. Some of the recommendations for future improvements to the prospectus are discussed next.



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System for Award Management (SAM)

1. Entity Registration and Core Data

	Field	Value
Entity Identification	Doing Business As Name	Space Exploration Technologies Corp.
	Legal Business Name	Space Exploration Technologies Corp.
	CAGE Code	3BVL8
	DUNS +4	120406462-0000
	Country of Incorporation:	USA
Registration	Registration Status	Active
	Purpose of Registration	All Awards
	Registration Expires	2021-11-13 16:05:41.641
Exclusions	Has Known Exclusions	No
Financial Information	Credit Card Usage	No
	Corporate Structure	Corporate Entity (Not Tax Exempt)
	Debt Subject to Offset	No

2. Past Performance Contact

Contact Name	Address
JULIE JIRU	1 Rocket Road Hawthorne, CA, USA, 90250

E-mail Address	Telephone Number
Not Provided	Not Provided

3. Representations and Certifications

	Item	Answer	Reference
FAR 52.209-5 (Responsibility Matters)	Debarment/Suspension	No	-5(a)(1)(i)(A)
	Civil Judgments	Yes	-5(a)(1)(i)(B)
	Criminal or Civil Charges	No	-5(a)(1)(i)(C)
	Deliquent Taxes	No	-5(a)(1)(i)(D)
	Contacts Terminated	No	-5(a)(1)(ii)

4. North American Industry Classification System (NAICS) Codes

Note. There is no statutory requirement for a firm to assert any particular NAICS within SAM (see, or instance, GAO Decision B-413198). The first ten codes are listed below, or fewer if the firm asserts membership in less than ten industries.

NAICS	Description
336414	Guided Missile and Space Vehicle Manufacturing
541330	Engineering Services
541715	Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)
517919	All Other Telecommunications
336411	Aircraft Manufacturing
481212	Nonscheduled Chartered Freight Air Transportation
517410	Satellite Telecommunications

Federal Awardee Performance and Integrity Information System (FAPIIS)

1. Government-Entered Records

Record Type	Records	Count
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Defective Pricing	None	0
DoD Determination of Contractor Fault	None	0
Information on Trafficking in Persons	None	0
Non-Responsibility Determination	None	0
Recipient Not-Qualified Determination	None	0
Subcontractor Payment Issues	None	0
Termination for Cause	None	0
Termination for Default	None	0
Termination for Material Failure to Comply	None	0

2. Records on Proceedings

See Federal Acquisition Regulation (FAR) Provision 52.209-7, *Information Regarding Reponsibility Matters*. Entities provide required proceedings information within contractor registration. FAPIIS updates data extracts monthly.

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Question 2. Within the last five years, has your business or organization (represented by the DUNS number on this specific CCR record) and/or any of its principals, in connection with the award to or performance by your business or organization of a Federal contract or grant, been the subject of a Federal or State (1) criminal proceeding resulting in a conviction or other acknowledgment of fault; (2) civil proceeding resulting in a finding of fault with a monetary fine, penalty, reimbursement, restitution, and/or damages greater than $5,000, or other acknowledgment of fault; and/or (3) administrative proceeding resulting in a finding of fault with either a monetary fine or penalty greater than $5,000 or reimbursement, restitution, or damages greater than $100,000, or other acknowledgment of fault?

Proceedings with Affirmative Responses to Questions 1 and 2

Disposition	Administrative	Civil	Criminal
Conviction/Finding of Fault	0	0	0
Other Acknowledgement of Fault	0	0	0

Contractor Performance Assessment Reporting System (CPARS)

Structured data on contractor performance is not yet available from CPARS. Archival contractor performance data could be integrated if it becomes available.

FOR PROTOTYPE USE ONLY

Figure 15. Updated Prospectus (Page 1)

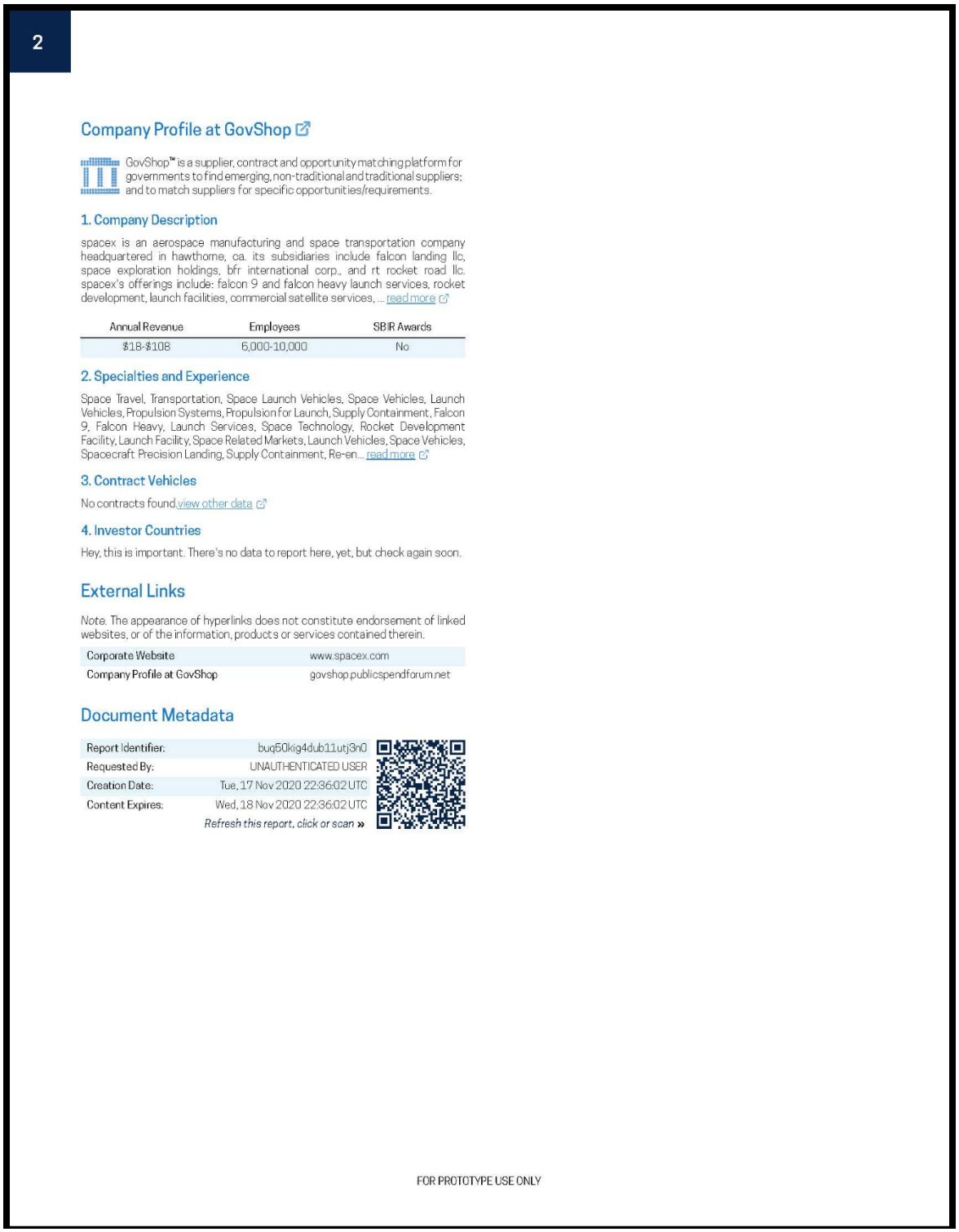

Figure 16. Updated Prospectus (Page 2)

Previously only SAM and FAPIIS data were being pulled for the prototype. Based on feedback, we also incorporated commercial sources of information. GovShop is similar

to Yelp but it's for those who business with the government. Company's profiles are filled out with publicly available data, but they also can add additional information to make their profiles more attractive to government buyers. In the spirit of continuous improvement, the Federal Procurement Data System (FPDS) also has relevant information that can be utilized for the CRD process. To this end, the next version of the prototype will include FPDS data, such as top 10 places of performance and top five award agency IDs. Each one of these areas provides additional information that is either not currently available on SAM or FAPIIS or is available in a clearer format from FPDS.

Future versions of the CRD should include a link to the CPARS artificial intelligence (AI) tool. Currently under development, this tool will be able to synthesize all the records a contractor has in CPARS and flag key indicators within the narrative portion of the report. Once this tool is operational, the next step is the prototype being able to provide information that can only be accessed through two-step authentication, such as the DoD's CAC and PIN. Access to this information, such as the records in CPARS, will allow for a CO to make sure their determination is based off all available information, helping the CO make the most informed decision possible.

Future iterations of the CRD should include a determination document. Though not required by the FAR, many COs do utilize some form of formal documentation to document how they arrived at both a responsible and nonresponsible determination.

C. PHASE V: CONTINUOUS IMPROVEMENT

The final phase in Harrington's (1991) BPI model is continuous improvement. The two ways to focus on continuous improvement are by qualifying the process and benchmarking the process.

1. Qualify the Process

Because each agency may have additional guidance for conducting CRDs or may be able to utilize more automation than other agencies, each agency wanting to improve its CRD process should conduct a BPI effort of its own. When an agency chooses to undertake a BPI effort for the CRD process, it should make sure to understand where on the classification levels its current process is and where it wants its new efforts to place it. Most

agencies are operating the CRD process at a Level 5 or 6 since there is no published data on agencies' CRD processes and measurements, which would allow the CRD process to be classified at a higher level than 5. Qualifying the current process and setting goals for where an agency would like to see the CRD process in the next three, six, and 12 months helps to focus the organization on continually improving the CRD process.

2. Benchmark the Process

There are two types of benchmarking: First, the USG can benchmark a process against other federal organizations, and second, the USG can benchmark against the commercial sector.

a. Benchmarking within the Federal Government

Benchmarking is already occurring throughout the USG regarding the CRD process. Starting with the IRS's use of a bot transforming into the Army's DORA bot, many organizations are using these two agencies' CRD processes as benchmarks. However, even with these improvements happening, there is still room for improving the CRD process. Agencies should make sure that they are considering what commercial companies are doing to help guide future improvements in this area as well.

b. Benchmarking against the Commercial Sector

In 2016, the Secretary of Defense (SECDEF) directed the Defense Business Board (DBB) to look at how private companies were already utilizing or planning to use automated systems within the areas of business that the DoD also conducts (DBB, 2017). In Fiscal Year 2017, the DBB published a report titled *Implications of Technology on the Future Workforce*. Because most federal organizations are organized in ways that mimic industry, with human resources, finance, and purchasing departments, "the same benefits realized through automating business processes in the private sector should be achievable in DoD" (DBB, 2017). Regarding data processing, the report had the following to say:

> Data processing appears to be the biggest area in which the private sector is pursuing automation. Reducing the volume of paper forms and labor-hours dedicated to manually entering data can decrease processing errors and cycle times. Automating these processes can exponentially increase an organization's ability to process even larger volumes of data, which also

> improves analyses based on that data, and in turn, increases accuracy and speed of decision- making. Companies also found that automation of business processes directly translated to decreased labor and operating costs, increased employee productivity, and improved regulatory compliance. Furthermore, there is a direct correlation between automation of business processes and higher customer satisfaction levels. (DBB, 2017, p. 13)

Another area in which the report speaks to commercial practices is within BPI initiatives. The DBB finds that commercial companies that were successful in implementing change in their business processes were ones that followed a roadmap and included the six foundational elements to BPI. The roadmap includes the following:

> identify the right opportunity; validate and prepare it to be automated; identify and acquire the workforce needed to pursue automation; develop the plan; ensure adequate governance and infrastructure to support the automation; demonstrate positive impacts of automation; adjust the automation change to the proper scale; and once in place sustain the benefits and create a culture of continuous process improvement. (DBB, 2017, p. 20)

Finally, another place that the commercial sector can be helpful is in the discussion of responsibility. There is a good amount of literature on supplier selection and pre-selection techniques; however, supplier selection is equivalent to deciding which offeror to award to during source selection in federal contracting, and pre-selection is related to what are called either a qualified bidder lists (QBLs) or qualified manufacturer lists (QMLs). One other technique that commercial companies use is supplier prequalification, which is the closest practice to the CRD process in the USG. Table 19 shows different companies' prequalification criteria compared to the seven standards in FAR as well as additional criteria these companies use.

Table 19. Commercial Practices

	USG[1]	Boeing[2]	Lockheed[3]	Bombardier[4]	Tech Uni of Kenya[5]
Adequate Financial Resources	X	X	X	X	X
Be able to comply with proposed delivery/performance schedule	X				X
Take into consideration existing commitments	X				
Performance Record	X		X		X
Record of Integrity and business ethics	X				X
Have necessary organization (or ATO)	X	X	X	X	X
Have necessary experience (or ATO)	X	X	X	X	X
Have necessary accounting controls (or ATO)	X				
Have necessary operational controls (or ATO)	X	X	X	X	X
Have necessary technical skills (or ATO)	X	X	X	X	X
Have necessary production E&F (or ATO)	X	X	X	X	X
Have necessary construction E&F (or ATO)	X	X	X	X	X
Have necessary technical E&F (or ATO)	X	X	X	X	X
"Be otherwise qualified and eligible to receive an award under applicable laws and regulations"	X	X	X	X	X
Environmental		X	X		
Same Supply Chain Software		X	X		
Geographic Area		X	X	X	

The information from this table was pulled from the following websites:

1—https://www.acquisition.gov/far/part-9#FAR_Subpart_9_1

2— https://www.boeingsuppliers.com/supplier-capability-short-form--final-04072020.pdf

3 - https://podio.com/webforms/8182136/612474

4 - https://www.bombardier.com/en/transportation/suppliers/potential-suppliers/bombardier-transportation-supplier-pre-selection-form.html

5 - http://tukenya.ac.ke/sites/default/files/downloads/tenders/PREQUALIFICATION%20OF%20SUPPLIERS%202019-2021.pdf

VII. CONCLUSION

This chapter concludes this report by summarizing the data presented while also providing recommendations for future research.

A. CONCLUDING THOUGHTS

In the May 2020 issue of National Contract Management Agency (NCMA) magazine *Contract Management*, Editor-in-Chief Ryan Burke (2020) says, "Organizations that have spent decades failing to innovate may not recover, and those that fail to adapt in the current environment may not survive" (p. 4). Though speaking specifically about the COVID-19 crisis sweeping the globe, his words reach beyond just the crisis. The USG has failed to maintain parity with civilian companies, let alone competing nations, when it comes to support technologies. Commercial companies are using a single system like Oracle or Coupa to track invoices, write contracts, and manage supply chains (McCrea, 2019, para. 10). The USG can improve the current acquisition processes by using some of the most innovative technologies.

The USG is struggling to integrate new technologies into current business processes without a structured approach to improve these processes. Innovative technologies are improving parts of a process while leaving the whole process looking similar to before the new technology was used. Business as usual for the USG does not currently include a lot of automated technologies. Changing employees' jobs from performing mostly low-value tasks to automating those low-value tasks and refocusing on higher value tasks will be tough. Once the USG understands that if it takes a structured approach to BPI, meaningful change can occur to these processes.

BPI offers a proven structured approach to not only integrating new technologies into business processes, but also improving other areas of business processes that are causing inefficiency, ineffectiveness, and a lack of adaptability. By using BPI in the CRD process improvement effort, the CRD process has demonstrated the potential to achieve significant improvement in these areas.

By modifying the BPI process presented by Harrington (1991), I structured my approach so that it provided the most benefit within the constraints of the resources available to conduct a prototype CRD process. After analyzing the current process, I provided recommendations on improvements to the CRD process and assisted my advisor in producing a prototype to demonstrate some of these improvements. Finally, after receiving feedback on the initial prototype design, my advisor and I revised the prototype to incorporate some of the most common feedback.

The primary conclusion of this project is that the CRD process should be continuously improving. The CRD process should continue its BPI path, always looking for feedback and benchmarks to guide its path forward. As a cornerstone to every purchase made by the USG, the process of a responsibility determination can be a proving ground for many new technologies and innovative processes. The work done for this project is only a starting point for others to continue. For example, moving the prototype into a CWS would help to demonstrate a paradigm shift from a USG CWS being just for writing contracts to a CWS that is more of a contracting support system, a system that provides support to the CO in ways such as assisting in writing a contract, helping to meet all FAR requirements, and gathering data to be used by COs in their day-to-day decisions.

B. FUTURE WORK

In the nature of BPI, improvements there is continued work to be done on the prospectus. First, when the transition from SAM.gov to beta.SAM.gov occurs, the API that the prospectus currently hits will no longer be valid. The most important next step for the prospectus is to change from the legacy SAM API to the new beta SAM API, which will include the data from both SAM.gov and FAPIIS.gov. A second area of work for the prospectus is to get the tool into CWS across the USG. Appian, the company behind the AF's CWS, has already begun this work in their developmental environment but has yet to make it operational in the AF's CWS. To really see an increase in efficiency and effectiveness, the CRD needs to be placed in a CWS; however, just placing the prospectus into a CWS would be to neglect the last two phases of the BPI method. Agencies must make sure that there is an area to provide feedback on the prospectus within the CWS so that it can continually be improved. Finally, another way the prospectus can be improved

is by incorporating machine learning and AI methods to the data it gathers. A potential future source of data are publicly available news sources. A more advanced version of the prospectus could generate a search of the most popular and reliable news sources for information related to a prospective contractor, and then proceed to scan those sources for keywords it has generated for the company or provide a list of the most common words used to describe the company. This last area of improvement brings the prospectus out of just a responsibility determination tool and into being a supplier intelligence tool.

One area of future work is consolidating different data processing areas in the pre-award process to reduce duplicative work. Between market research, sole source determinations, responsibility determinations, fair and reasonable determinations, past performance reviews, and even more processes, many contain similar aspects. It would be beneficial to conduct research on the requirements of the different pre-award processes that require data processing and produce recommendations on how to improve efficiencies between the processes. One research method could be to gather user stories of how COs would want to utilize the prospectus document within the acquisition process.

Following the previous suggestion, this topic area would benefit from research into how the information gathered in federal government preaward processes compares to the commercial practice of gathering supplier intelligence. Supplier intelligence has a large body of research behind it, but there is a gap in the literature applying this topic to federal government procurement. Not only will the comparison of information gathered be beneficial, but the technologies and methods used to gather the data will also be valuable. Other documents are required prior to awarding a contract that require the CO to look at similar criteria as a CRD. Though this is well known, no single source is available to see an overview of a company on each of these measures.

Finally, one more area of research could be with internal and IG audits with respect to contractor responsibility. The biggest question is if these audits actually capture all the requirements in FAR 9.1 for responsibility, and, if they do not, what can be done to make sure COs are following the standards put forth in FAR 9.1?

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APPENDIX A. PROCESS WALK-THROUGH INTERVIEWS QUESTIONNAIRE

Research into the Contractor Responsibility Process

Objective

The objective of this discussion is to one, gather insight from subject matter experts (SMEs) on how contractor responsibility is currently documented in operational, or base support, contracting units within the Air Force; and two, discuss potential enhancements to the current process to help improve lethality and readiness within the Air Force as a whole.

Background

Current regulation requires a contractor be found responsible prior to being awarded a contract. There are seven different criteria that must be examined prior to finding a contractor responsible, and there are three required websites to check when the contract is over the simplified acquisition threshold. Below this threshold, only one website is required. Most importantly, the FAR only requires documentation if a contractor is found not responsible. The Air Force provides contracting officers (COs) with a preapproved (though not required) template for documenting contractor responsibility. The end goal of this project is to see how a reevaluation of the current contractor responsibility determination process can add to readiness and lethality within the Air Force by improving efficiency.

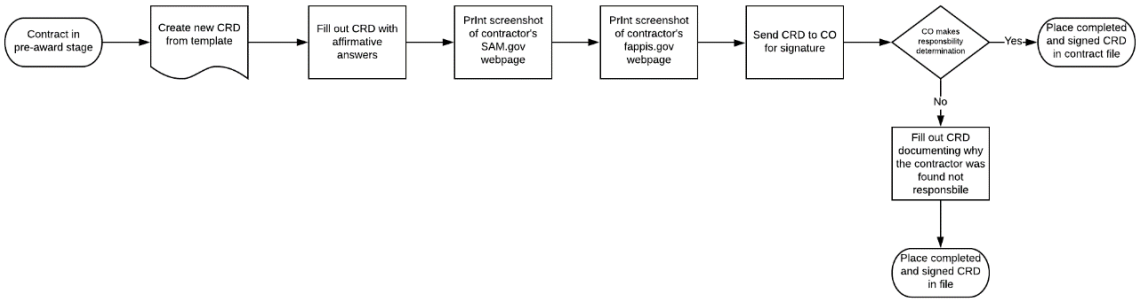
Nature of Research

This interview is being conducted by a U.S. Air Force contracting officer in the course of her MBA program (thesis research) at the Naval Postgraduate School. The research has been requested by the U.S. Air Force. The results of this research will be made publicly available once the study is completed.

This topic is exceptionally important, and we appreciate your support of and participation in our research!

Question 1: What is the current process to find a contractor responsible?

Question 2: What are some critiques to the following flowchart in terms of how it reflects the current process and if it is compliant with the current regulations for CRDs?



Question 3: If available to contracting officers, what additional data sources, resources in general, or processes could be utilized to improve the current contractor responsibility process?

APPENDIX B. CONTRACTOR RESPONSIBILITY DETERMINATION TEMPLATES

DEPARTMENT OF THE AIR FORCE

Determination and Findings

Exercise the Option to Extend the Term of the Contract

FA4690-17-C-0002

The Contracting Squadron, _____, proposes to exercise the Option to Extend the Term of the Contract with (insert company name here).

FINDINGS

1. Pursuant to FAR 17.207(c) and DFARC 217.207(c), the contracting officer may exercise an option only after determining the following:

   a. Funds are available. Planning Form 9 received for FY19 in the amount of _____ The Form 9 is currently (un)/funded but includes the statement that the amount is included in the financial plan for FYXX. The option will not be exercised until certified funding is received.

   b. The exercise of the option fulfills an existing need. Per SCO endorsement to the squadron letter, there is a definite need for continuity of this service. Disruption would have a negative impact on the using organization in meeting their customer needs.

   c. Exercising the option is the most advantageous method for fulfilling the Government's need, price and other factors considered. Taking into account the need for continuity of operations, the savings in administrative costs by exercising the option as compared to the administrative cost of awarding a new contract, the option prices are the best available. The current contract was awarded based on adequate price competition and was awarded to the lowest priced offeror. There is no reason to believe that a new solicitation would produce a better price or a more advantageous offer than that offered by the option.

   d. The base and all option periods were synopsized IAW FAR Part 5.

   e. The contractor is not listed in the System for Award Management Exclusions. SAM was checked on (insert date) and no exclusions were listed. SAM will be checked again immediately prior to award.

   f. The contractor's past performance evaluations on other contract actions have been considered. A report was run in PPIRS and the only assessment report available was for the subject contract with period of performance of (insert dates).

Page **1** of **3**

g. The contractor's performance on this contract has been acceptable. A review of Monthly Performance Evaluation Summary reports in CORT found the monthly ratings were from satisfactory to very good for all months to date for the current period of performance.

h. The contractor's record in the System for Award Management database is active through (insert dates), and the contractor's Data Universal Numbering System (DUNS) number, Commercial and Government Entity (CAGE) code, name, and physical address are accurately reflected in the contract document.

2. Per FAR 17.207(d), an informal analysis of prices and an examination of current market conditions indicate that the option is the more advantageous offer. This is based on the following findings:

   a. The option was evaluated as part of the initial competition and will be exercised at the current prices contained in the contract. The current prices were competitively bid and determined fair and reasonable at the time of the original award.

   b. Administrative cost savings would be realized by exercising the option to continue contract performance. An informal analysis indicates there are no changes in the local economy that would affect the cost of performance.

   c. There have been no significant changes in technological innovation which would lead the Air Force to anticipate any reduction in price resulting from resolicitation of this requirement.

   d. There were no major changes in the local or general economy that would substantially affect performance.

3. Exercise of the option will be accomplished in accordance with contract clause 52.217-9, Option to Extend the Term of the Contract, and meets the requirements of Part 5 and 6 of the FAR:

   a. The clause, 52.217-9, Option to Extend the Term of the Contract, included in the contract, requires a preliminary written notice of the Government's intent to extend at least 60 days before the contract expires. The written preliminary notice was sent out and acknowledged by the contractor on (insert date) which is 60 days before the contract expiration date of (insert date).

   b. The option must be exercised by written notice to the contractor within 30 days.

   c. The option was evaluated as part of the original competition.

   d. The option price was established at time of award and can only be changed as the result of changes to prevailing labor rates provided by the Secretary of Labor.

4. Per FAR 9.104-1, the contractor is determined to:

a. Have adequate financial resources to perform the contract, or the ability to obtain them. FAPIIS was reviewed IAW FAR 9.104-6 concerning the financial responsibility of (insert company name) has not received any negative reports according to FAPIIS.

b. Be able to comply with the required performance schedule. The contractor has demonstrated during its performance that is capable of performing the work required. They have received ratings from satisfactory to very good for all aspects of surveillance during the prior year.

c. Has a satisfactory performance record. The contractor has received ratings from satisfactory to very good for all aspects of surveillance during the prior year.

d. Has a satisfactory record of integrity and business ethics; SAM was searched for exclusions and none were found.

e. Has the necessary organization, experience, accounting and operational controls, and technical skills;

f. Has the necessary technical equipment and facilities;

g. Is otherwise qualified and eligible to receive an award under applicable laws and regulations.

DETERMINATION

1. Based on the information contained in the above findings and a record financial stability, (insert company name) is determined to be a responsible contractor IAW FAR 9.104.

2. Based on the above findings and in accordance with FAR 52.217-9, Option to Extend the Term of the Contract, it is determined the exercising the second option of this contract is the most advantageous method of fulfilling the need and therefore is in the best interest of the Air Force.

3. Pursuant to FAR 17.207, the 2nd option period will be exercised.

(insert name)
Contracting Officer
Date: _____

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"PRICE FAIR AND REASONABLENESS DETERMINATION and AWARD DOCUMENTATION"
FEDERAL SUPPLY SCHEDULE PROCEDURES UNDER FAR SUBPART 8.4
F2FF3377116AW01 Red Hat Software

1. Acquisition Strategy

☒ Competitive

- ☐ Fair Opportunity
- ☐ Small Business Set-Aside
- ☒ Other: Required Source

☐ Limited Source/Single Source

*IAW FAR 8.405-5, Although the preference programs of part 19 are not mandatory in this subpart, ordering activity Contracting Officers may at their discretion set aside orders for any of the small business concerns identified in 19.000(a)(3).

2. Solicitation

☒ Order Exceeds Micro-Purchase Threshold But NOT the SAT (IAW FAR 8.405-1(c)):

- ☐ At least three schedule contractors have been surveyed through GSA Advantage (print-outs are attached)
- ☐ Catalogs or pricelists of at least three schedule contractors have been reviewed (print-outs are attached)
- ☒ Quotes have been requested from at least three schedule contractors
- ☐ Quotes have been requested from less than three schedule contractors and circumstances are documented in the justification document provided in TAB 3
  - ☐ Justification document has been posted to Federal Business Opportunities

☐ Order Exceeds the SAT (IAW FAR 8.405-1(d) and DFARS 208.405-70)

- ☐ RFQ with description of the supplies to be delivered and basis upon which the selection will be made was posted to GSA eBuy
- ☐ A Limited Source Justification has been approved and posted to Federal Business Opportunities (FAR 8.405-6)

3. Pricing:

☐ See Abstract. ____ quotes were received. Line item pricing is provided in the attached Abstract.

☒ See Table Below. __ quotes were received. Total pricing is provided in the table below.

Vendor Name	Total Quoted Price	Revised Quoted Price
	$	$
	$	$
	$	$

☐ Order exceeds the SAT

- ☐ Price reduction has been sought IAW FAR 8.405-4.

☒ SAM registrations were checked upon receipt of each quote and filed with the quote in the contract file. IAW FAR 4.1103(a)(1), unregistered offerors have been notified that they must register in order to be considered for award.

4. Evaluation

☒ A technical evaluation was conducted by the requiring activity and the results are documented and contained in the contract file.

☒ For orders where an RFQ was issued:

In accordance with the evaluation criteria included in the RFQ, "The Government will award a FFP contract to the technically-acceptable and responsible offeror with the lowest priced offer. Offers will be determined technically acceptable if they meet all of the requirements identified in this Solicitation."

"PRICE FAIR AND REASONABLENESS DETERMINATION and AWARD DOCUMENTATION"
FEDERAL SUPPLY SCHEDULE PROCEDURES UNDER FAR SUBPART 8.4
F2FF3377116AW01 Red Hat Software

☒ ___Carahsoft Technologies Corp._ quote was determined technically acceptable and provides the lowest overall price. Accordingly, award will be made to this offeror.

☐ _____ provided the lowest priced offer; however, their offer was not determined technically acceptable for the following reasons: _____.
_____ quote was the next lowest offer and determined technically acceptable. Accordingly, award will be made to this offeror.

5. Price Fair and Reasonable Determination:

Determination of Price Reasonableness (IAW FAR 8.404(d) DEVIATION). GSA has determined the prices of supplies, fixed price services, and rates for services offered at hourly rates to be fair and reasonable for the purpose of establishing the schedule contract. The Contracting Officer shall make a determination of fair and reasonable pricing for individual orders using the proposal analysis techniques at 15.404-1.

☒ Price Analysis

☒ FAR 15.404-1(b)(2)(i) – Comparison of proposed prices received in response to the solicitation.

☐ FAR 15.404-1(b)(2)(ii) – Comparison of proposed prices to historical prices paid, whether by the Government or other than the Government, for the same or similar items: _____

☐ FAR 15.404-1(b)(2)(iii) – Use of parametric estimating methods/applications of rough yardsticks: _____
_____

☐ FAR 15.404-1(b)(2)(iv) – Comparison with competitive published price lists, published market prices of commodities, similar indexes, and discount or rebate arrangements: _____
_____

☐ FAR 15.404-1(b)(2)(v) – Comparison of proposed prices with independent Government cost estimates: _____
_____

☐ FAR 15.404-1(b)(2)(vi) – Comparison of proposed prices with prices obtained through market research for the same or similar items: _____
_____

☐ FAR 15.404-1(b)(2)(vii) – Analysis of data other than certified cost or pricing data provided by the offeror: ___
_____

6. Contractor Responsibility:

☒ Contractor is registered in the SAM database, representations and certifications have been completed, and the contract file has been documented accordingly. SAM registration is active on day of contract award.

☒ To the best of the Contracting Officer's knowledge, the contractor is responsible and meets the requirements of FAR 9.104-1(a) – (g).

7. Over the Simplified Acquistion Threshold

☐ Requirement exceeds Simplified Acquisition Threshold

☐ Federal Awardee Performance and Integrity Information System (FAPIIS). Contractor information contained in FAPIIS regarding performance has been reviewed, and the contractor is determined to be responsible and shall be awarded the contract. A copy of the website printout is included in the contract file. (IAW FAR 9.104-6)

☐ IAW Memorandum dated 27 April 2011, Subject: Improving Competition in Defense Procurements – Amplifying Guidance.

☐ Solicitation was posted for 30 days.

"PRICE FAIR AND REASONABLENESS DETERMINATION and AWARD DOCUMENTATION"
FEDERAL SUPPLY SCHEDULE PROCEDURES UNDER FAR SUBPART 8.4
F2FF3377116AW01 Red Hat Software

☐ Solicitation was not posted for 30 days; however, more than one quote was received.
☐ Solicitation was not posted for 30 days and only one quote was received.
☐ Requirement was re-solicted for an additional 30-day period (DFARS 215.371-5)
☐ Waiver for requirement to re-solicit for an additional 30-day period has been received from AFICA/KO (AFFARS 5315.371-5).

☐ Peer Review. An internal, independent review has been conducted. All required documents for this procurement action have been logically prepared, completed, signed where required, and appropriately filed in the contract file.

Peer Reviewer's name: _____

Peer Reviewer's signature & date: _____

8. Legal (AFFARS 5301.602-2(c))

☐ Requirement exceeds $500,000, legal review has been obtained and appropriately filed in the contract file.

9. Business and Contract Clearance (AFFARS 5301.9001(f)(3))

☐ $500k - $1M – One Level Above Contracting Officer

☐ $1M - $10M – Squadron Commander or Director of Business Operations

10. Additional Information/Comments (as needed)

_____

_____

Based on the rationale provided above, contractor's price is determined fair and reasonable, and it is in the best interest of the Government to award a delivery order to _____

_____	_____
NAME	NAME
Contracting Specialist	Contracting Officer
DATE:	DATE:

DETERMINATION AND FINDINGS FOR CONTRACTOR RESPONSIBILITY
CONTRACTOR:
CONTRACT:
PROJECT TITLE:

On the basis of the following findings and determinations, this unit, (insert unit name) Contracting Squadron, proposes to issue subject contract action to (insert contractor name).

FINDINGS

1. The contract action is a Firm-Fixed Price task order entered into for the purpose of satisfying design requirements on (location).

2. Financial Resources: From (insert date) to present, (insert company) has been awarded approximately (insert amount) in federal contracts. (Insert company) has demonstrated financial capability in that there have been no late or non-payments to subcontractors reported to the Contracting Officer and no Federal Awardee Performance & Integrity Information System (FAPIIS) reported Defective Pricing or Subcontractor Payment cases.

3. The System for Award Management (SAM) was checked before issuance of this contract action. Said company had no exclusions listed in SAM. A search of the company name and DUNS number were also accomplished using FAPIIS and no negative reports were found on FAPIIS for the company.

4. Contractor Current Performance: A search was conducted in the Contractor Performance Assessment Reporting System (CPARS), on (insert date). This searched shows that the company has performed satisfactorily on all awards/task orders since (insert date). (Insert amount) assessments have been entered, and the summary of results for the areas of Quality, Cost, Schedule, Small Business, and Management are as follows: X Exceptional, X Very Good, X Satisfactory, X Marginal, and X Unsatisfactory.

DETERMINATION

In accordance with FAR 9.104-1 on the basis of findings set forth above, I determine that this contractor:

a) Has adequate financial resources or the ability to obtain such resources as required during the performance of the proposed contract.
b) Will be able to comply with the required or proposed delivery or performance schedule and is not seriously deficient in performance of current contracts.
c) Has a satisfactory performance record.
d) Has a satisfactory record of integrity and business ethics.
e) Is otherwise qualified and eligible to receive an award under applicable laws and regulations.
f) Has the necessary production, construction, and technical equipment and facilities, or the ability to obtain them.
g) Is otherwise qualified and eligible to receive an award under applicable laws and regulations.

Based on the above, (insert contractor name) is responsible and eligible to receive further contracts at (insert location).

NAME
Contracting Officer

DETERMINATION AND FINDINGS
CONTRACTOR RESPONSIBILITY

Pursuant to FAR 9.103(b), a determination of contractor responsibility was conducted to verify if _____ is eligible to perform the subject contract in accordance with FAR 9.104-1.

FINDINGS

1. The (insert unit) Operational Contracting Division proposes to award the project above.

2. The company stated above has the capabilities to satisfactorily perform the work based on the following:
   a. The contractor has adequate financial resources or the ability to obtain such resources to perform the requirement.
   b. The contractor is able to comply with the required performance schedule.
   c. The contractor has a satisfactory performance record.
   d. The contractor has a satisfactory record of integrity and business ethics.
   e. The contractor has the necessary organization, experience, accounting and operational controls, and technical skills to perform the required services.
   f. The contractor has the necessary equipment to perform the required services.

DETERMINATION

Pursuant to FAR 9.104-1, it is determined _____ is a responsible contractor and is otherwise qualified and eligible for award of the subject contract under applicable laws and regulations.

NAME, Rank, USAF
Contracting Officer

[Enter security markings here -- or delete this text.]

Determination and Findings -- Contractor Responsibility / Non-responsibility

Program Title:

Contracting Office: [Organization/Office Symbol, Address]

Contractor Name: [Company Name, Address]

Solicitation/Contract Number:

Category: ☐ **Supplies** ☐ **Services** ☐ **Hybrid**

FINDINGS

General Standards of Responsibility (FAR 9.104-1 and DFARS 209.104). The contractor's ability to perform responsibly and to provide the required supplies and services under the subject solicitation/contract have been examined. The following elements of responsibility have been addressed.

1. Financial Resources

Describe the contractor's financial information or hardships. Will they prevent this offeror from fulfilling this contract? Do they have the ability to obtain the financial resources needed?

2. Meeting Delivery Requirement

Describe the contractor's quote/proposal. Does the quote/proposal indicate the contractor's ability to meet all delivery requirements?

3. Performance Record

Describe the contractor's past performance. Is it responsible or non-responsible? Give specific and relevant performance history, which can be found in... [insert the applicable contract number]

4. Business Integrity and Ethics

Describe the contractor's record of integrity and business ethics. Is their record satisfactory?

5. Organizational Structure

Describe the contractor's organization, experience, accounting and operational controls, and technical skills (or their ability to obtain them). Are they sufficient? Are there any deficiencies? Does the contractor have the ability to correct them?
Note specific considerations at DFARS 209.104-1(e) for cost-reimbursement or incentive type contacts that provide for progress payments based on costs or a percentage/stage of completion.

6. Production Capabilities

Describe the contractor's production, construction, and technical equipment and facilities, or their ability to obtain them. Are there any deficiencies? Does the contractor have the ability to correct them?

7. Otherwise Qualified and Eligible

Provide any other information that would make the contractor qualified and eligible for award.
Note specific considerations at DFARS 209.104-1(g)(i) for ownership or control by the government of a country that is a state sponsor of terrorism.

Special Standards of Responsibility (FAR 9.104-2)

Does this acquisition require special standards of responsibility? For example, does adequate contract performance require unusual expertise or specialized facilities?

Determination and Findings -- Contractor Responsibility / Non-responsibility

DETERMINATION

Based on the findings above, I have determined that the contractor [is] [is not] responsible in accordance with FAR 9.104-1.

Date	[Name & Title] [Organization, Phone Number] [E-mail Address]	Signature

Add 2nd Signature Remove 2nd Signature

Determination of Responsibility or Non-responsibility MEMORANDUM for Actions Over the Simplified Acquisition Threshold (SAT)

SUBJECT: Determination of Contractor Responsibility or Non-Responsibility

DATE:
VENDOR NAME:
DUNS NUMBER:

A. In accordance with FAR 9.104, the following has been reviewed and verified:

☒ The vendor **is** registered in the System for Award Management (SAM) at https://www.sam.gov,and was checked IAW FAR 9.405(d)(1) on: _____and date is current in SAM until: _____.

☐ Vendor **is not** registered in SAM, but one of the following exceptions apply. (See FAR 4.1102 exceptions that apply)

Supporting Rationale: _____

The vendor ☐ **has** active exclusions (such as: ☐ Prohibition/Restriction ☐ Ineligible Proceedings Completed), ☒ **has no** active exclusions (The vendor identified above is not listed as debarred, suspended or otherwise ineligible for award by any Federal agency).

The vendor ☒ **is,** ☐ **is not** IAW FAR 52.212-3, Vendor Representations and Certifications- Commercial Items, the vendor ☒ **has**, ☐ **has not** completed the annual representations and certifications electronically via system for award management.

B. The Contracting Officer has determined that:

The vendor ☐ **does,** ☐ **does not** have adequate resources to perform the contract, or the ability to obtain them (see 9.104-3(a));

Supporting Rationale: _____

The vendor ☐ **does,** ☐ **does not** have the necessary organization, experience, accounting and operational controls, and technical skills, or the ability to obtain them

1

(*including, as appropriate, such elements as production control procedures, property control systems, quality assurance measures, and safety programs applicable to materials to be produced or services to be performed by the prospective contractor and subcontractors*). (See 9.104-3(a)).

The vendor ☐ **does,** ☐ **does not** as have the necessary production and technical equipment and facilities, or the ability to obtain them (see 9.104-3(a)); and

The vendor ☐ **is able,** ☐ **is unable** to comply with the required or proposed performance schedule, taking into consideration all existing commercial and governmental business commitments;

The vendor ☐ **does,** ☐ **does not** have a satisfactory performance record (see 9.104-3(b) and subpart 42.15). A prospective contractor shall not be determined responsible or non-responsible solely on the basis of a lack of relevant performance history, except as provided in 9.104-2;

The vendor ☐ **does,** ☐ **does not** have a satisfactory record of integrity and business ethics (*for example, see FAR 9.104-3(c)* and *Subpart 42.15*

The vendor ☐ **has,** ☒ **has not** made an affirmative response per FAR provisions 52.209-5(a)(1)-Certification Regarding Responsibility Matters & 52.212-3(h) - Offerors Representations and Certifications - Commercial Items, have been reviewed.

Check for Federal Delinquency and tax debt as defined in FAR 52.209-11. This vendor responded that it ☐ **is,** ☒ **is not**, a corporation that has any unpaid Federal tax liability IAW 52.209-11.

Check for Felony Criminal Violation: The vendor ☐ **is**, ☒ **is not** a corporation that was convicted of a Federal felony criminal violation IAW 52.209-11.

C. Small Business Concern/Other than Small Business

☐ The vendor **is not** a small business, therefore section C **does not** apply.
☐ The vendor **is** considered a small business concern therefore, section C **applies.**
☐ IAW FAR 9.104-3(d)(2), the vendor is a small business, **is unable** to comply with the limitations on subcontracting per 52.219-14, and is considered **non-responsible**.

☐ The contracting officer has made a determination of **non-responsibility** with regard to this small business concern and has referred the matter to the Small Business Administration (SBA). Upon review SBA, shall determine whether to issue a Certificate of Competency (COC) per FAR 19.6 (Date sent to SBA: _____)

☐ The small business is otherwise **qualified and eligible** to receive an award under applicable laws and regulations (see also inverted domestic corporation prohibition at 9.108). **(Attached copy of Certificates of Competency)**

☐ As required by FAR 9.104-4 and 19.705-5(a) the vendor ☐ **has**, ☐ **has not** complied with subcontracting plans submitted on previous contracts.

The ☐ **small business vendor** / ☐ **other than small business** ☐ **is**, ☐ **is not** otherwise qualified and eligible to receive an award.

D. Determination

Based on the above, I hereby determine that (_____) ☐ **is**, ☐ **is not**, responsible within the definition of FAR 9.104-Standards. In support of this recommendation, the Government has completed a detailed review and assessment of the information provided in SAM.gov and Federal Awardee Performance and Integrity Information (FAPIIS).

As a result of the review the vendor is deemed ☐ **qualified** ☐ **not qualified, and is** ☐ **eligible** ☐ **ineligible** to receive an award under applicable laws and regulations.

_____ _____

Contracting Officer Signature **Date**

[Digital Signature]

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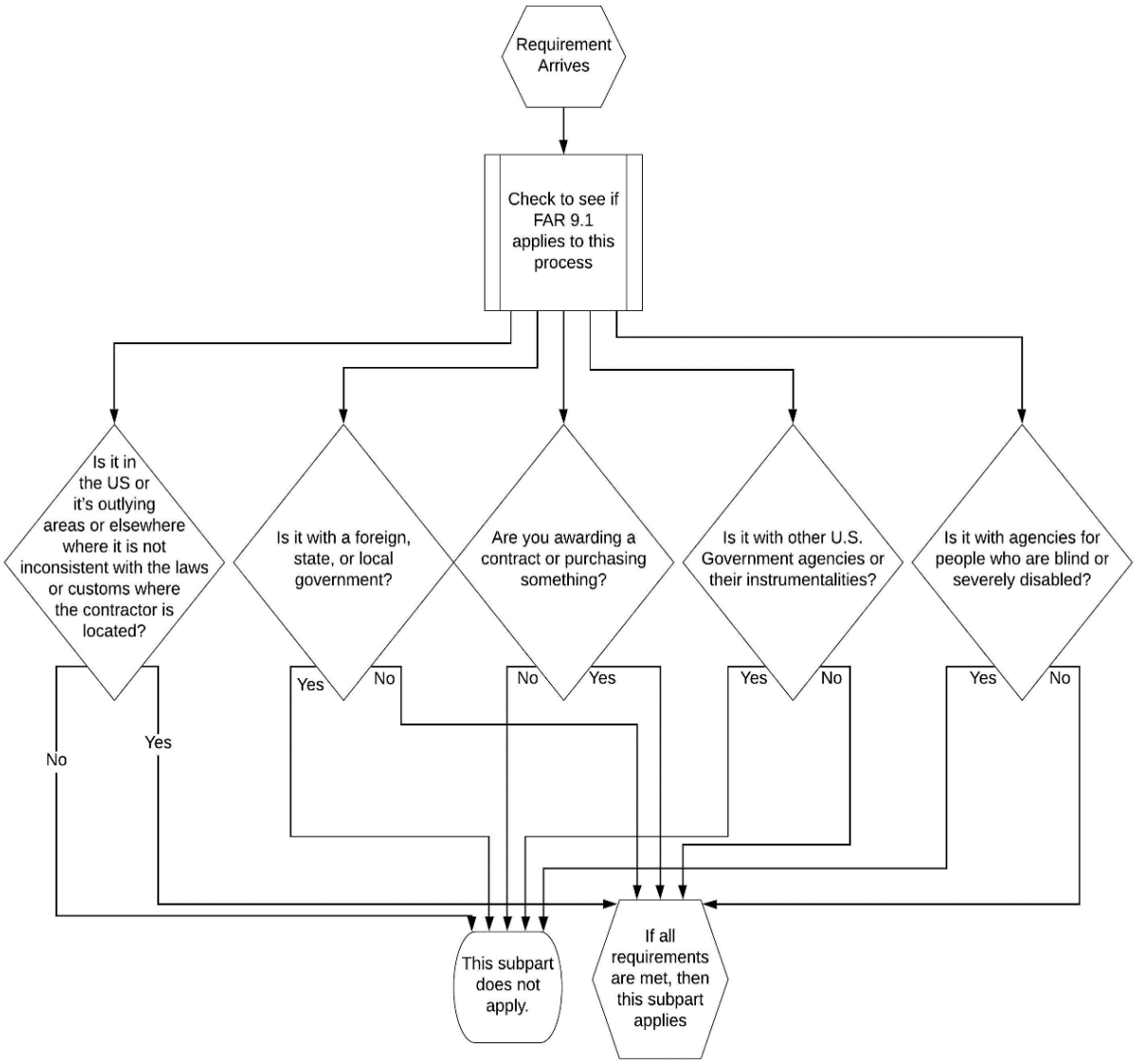
APPENDIX C. CONTRACTOR RESPONSIBILITY DETERMINATION FLOWCHARTS



Contractor Responsibility Determination: Subprocess 1 FAR 9.1 Applicability

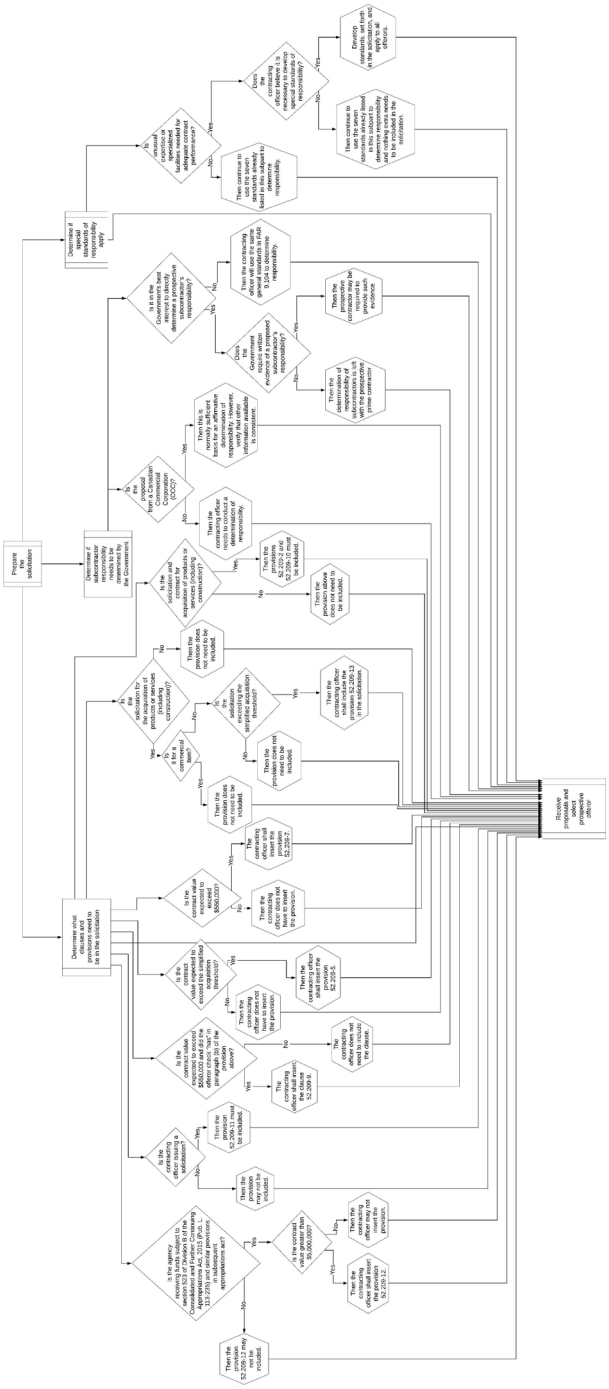


Figure 17. Contractor Responsibility Determination: Subprocess 2 Prepare Solicitation

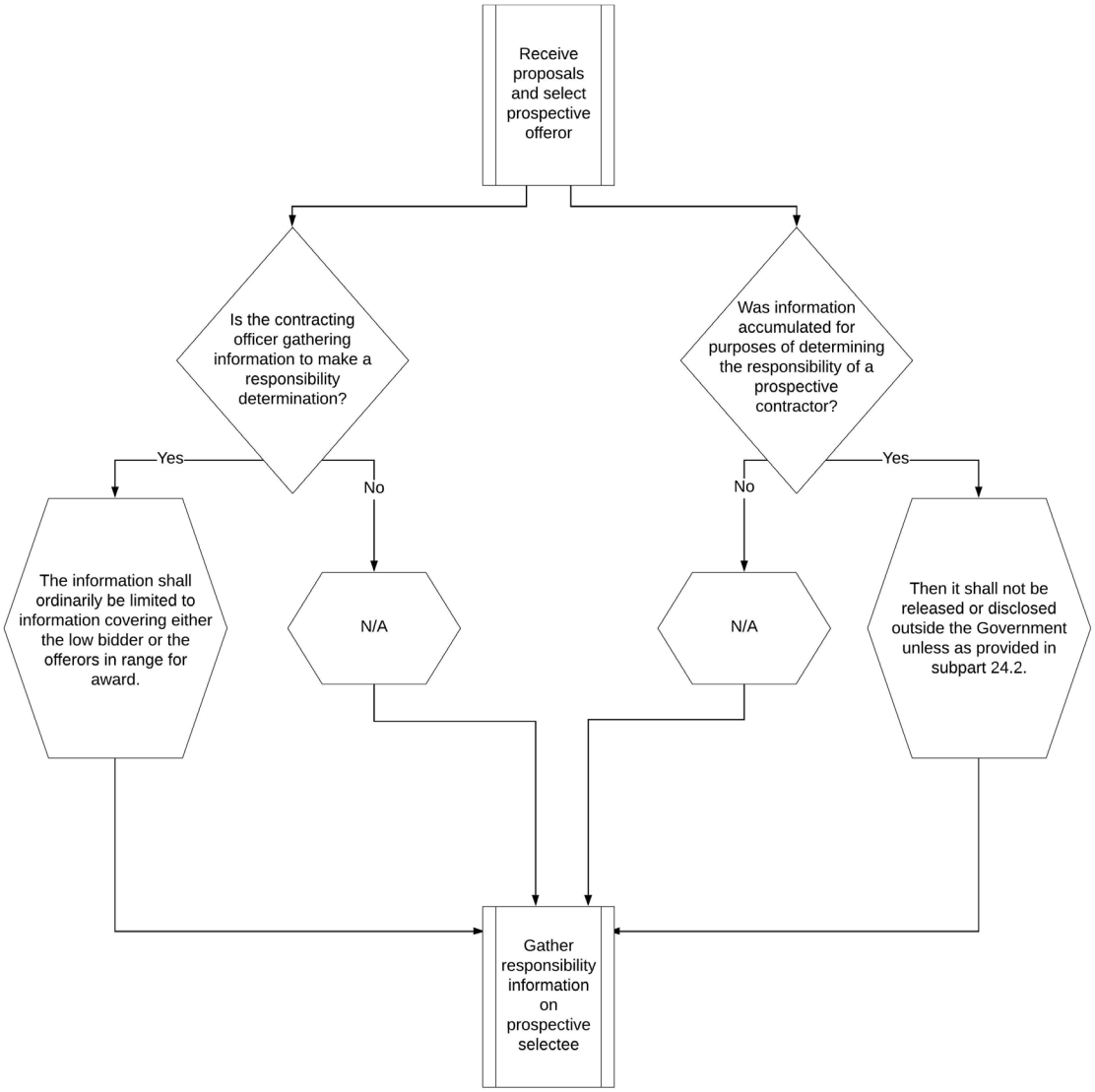


Figure 18. Contractor Responsibility Determination: Subprocess 3 Select Potential Offeror

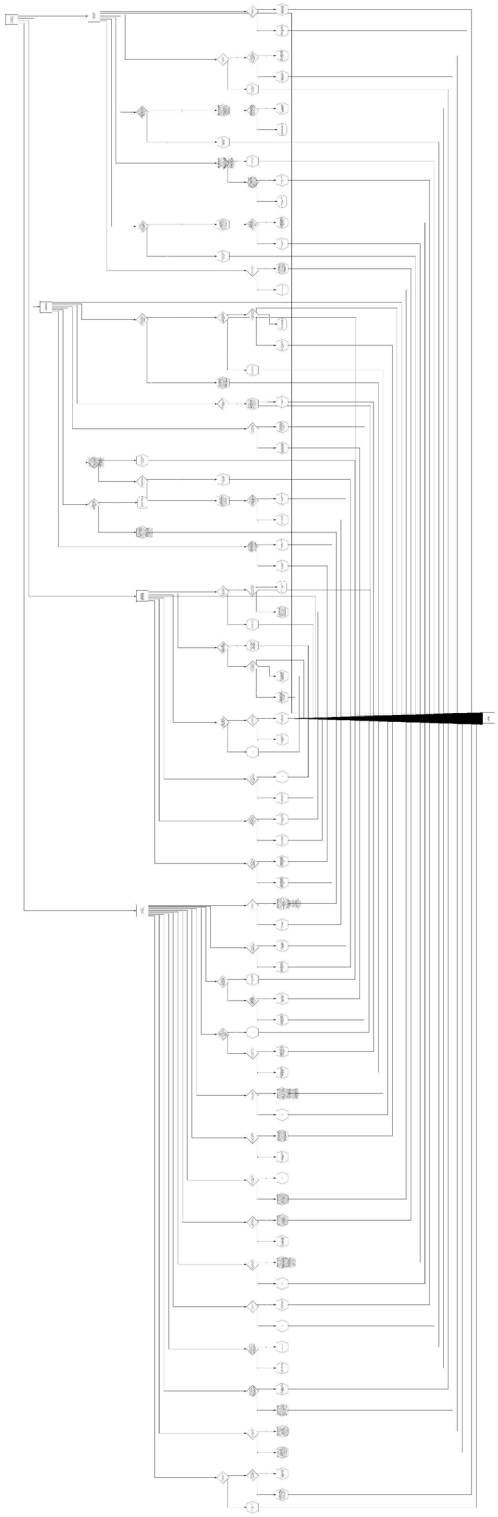


Figure 19. Contractor Responsibility Determination: Subprocess 4 Gather Offeror Information

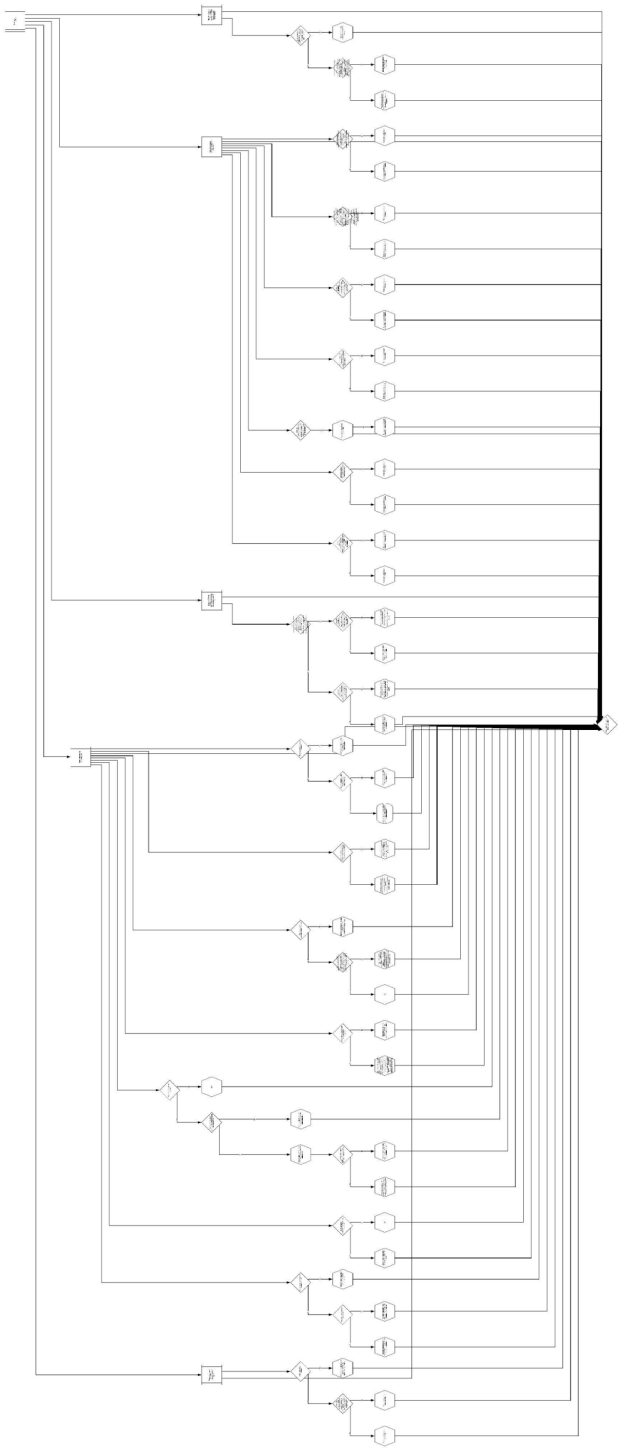


Figure 20. Contractor Responsibility Determination: Subprocess 5 Determine the Offeror Responsible or Nonresponsible

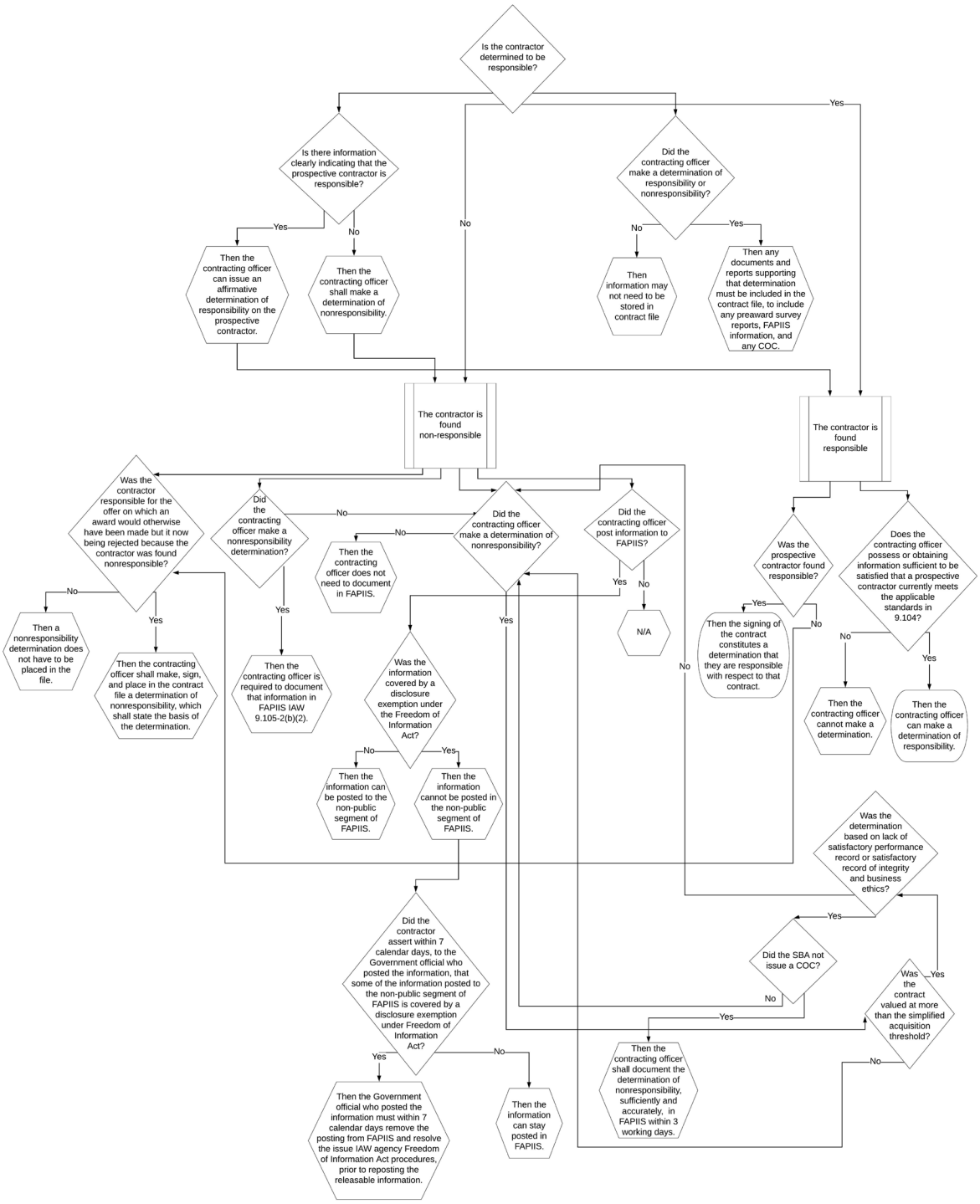


Figure 21. Contractor Responsibility Determination: Subprocess 6 and 7 Responsible and Nonresponsible Contractor

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