LMI

Trade Security Control Assessment Process Capability

Defense Logistics Agency

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Executive Summary

The Defense Logistics Agency (DLA) tasked LMI to analyze the current trade security control (TSC) assessment process and recommend approaches to upgrade and modernize through the application of emerging technologies and automated business processes. The objective was to research the requirements for a new TSC Assessment Office (TSCAO) business capability that incorporated advanced technologies. The project recommends technology integration opportunities and developed a high-level business case analysis (BCA), including an analysis of alternatives to improve efficiencies, reduce cycle times, and enhance reporting capabilities.

LMI's analysis included stakeholder interviews internal and external to DLA, as-is process mapping, biweekly technical working group meetings, and the development of a BCA. The overall TSC assessment process was satisfactory and requires minimal changes in steps or specific activities. However, the lack of automation throughout the process cannot be overstated. The process is cumbersome and relies heavily on repetitive, manual data entry. A new DLA policy directing the Joint Certification Program Office to leverage the assessment capability in the TSCAO could potentially increase the amount of work executed under the TSC process tenfold.

We concluded that the assessment process can be dramatically improved with the implementation of digital workflow automation (DWA) and robotic process automation (RPA). The BCA found a positive return on investment (ROI) for this automation, regardless of any future change in workload. While the return is less if the TSC maintains its current structure and volume, it is still a positive ROI, and has several key qualitative benefits:

- Reducing the current 65 percent average submission error rate to near zero
- Enabling new capabilities for management, such as improved metric tracking, real-time visibility, and faster response time for the customers
- Setting the framework to enable new modern digital capabilities such as artificial intelligence (AI).

If the Joint Certification Program (JCP) workload is added, the ROI increases dramatically, and still retains all the qualitative benefits. Therefore, we recommend that DLA enact the following:

- *Implementation of DWA.* To improve the efficiency, timeliness, and effectiveness of the TSC assessment process, a DWA solution should be implemented.

Implementing DWA record management will significantly reduce processing time and lay the foundation for further automation throughout the process.

- *Introduction of RPAs into the TSC assessment process.* The integration of RPAs, with a DWA solution to perform such actions as extracting data from documents, logging in to web applications, moving files and folders, copying and pasting data, and filling in forms, can improve process efficiency and productivity by enabling analysts to focus on actual assessment reviews.
- *Further research*. DLA should research using AI to improve the fidelity of the risk assessments of the TSC and JCP processes. This research should be coordinated with J6 and explore tools like fuzzy search, sentiment analysis, and machine learning to predict or classify bad actors.

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Chapter 1
Introduction

Background

The Department of Defense (DoD) safeguards export-controlled DoD property (including technical data, technology, and software) through implemented policy and procedures. Export Administration Regulations, International Traffic in Arms Regulations, the Arms Export Control Act, and other regulations and similar controls from the Department of Homeland Security (DHS) establish trade security controls (TSCs) on export or other transfers, demilitarized, or mutilation of DoD property to private individual or organizations. More specifically, DoD Instruction (DoDI) 2030.08 defines these transfers of export-controlled personal property as

> the sale, lease, loan, exchange, trade, barter, release or donation from the DoD to another person or entity outside of DoD control. Transfers can include, but are not limited to: military sales, surplus property sales, foreign excess property sales or donations, research collaboration, exchanges, consulting arrangements, co-development and co-production arrangements, exhibits, meetings and symposia, technical missions, employment, dissemination of patent information, release of technical reports and technical data, illicit acquisition of technology or articles, and access through ownership or substantial interest in a business or other organization.

Trade Security Control Program

The DoD TSC Program prevents the release and unauthorized use of material to individuals, entities, or countries unfriendly to the United States. Unauthorized areas or entities are designated by the Departments of State and Commerce and the director of Foreign Assets Control. Subject material includes items on the munitions list, commerce control list, and material designated by DoD as requiring demilitarization. The program also evaluates the release of critical technology in the context of export regulations.

By authority outlined in DoDIs 4160.28 and 2030.08, the Defense Logistics Agency (DLA) assists in the disposal or transfer of personal property to entities external to DoD under the TSC Program and manages control and oversight for the DoD Demilitarization Program. The DLA TSC Program Office (TSCPO), in the J34 Logistics Operations Policy and Strategic Programs Directorate, supplies management oversight and coordinates the approval process for post-sale material release. The DLA TSC Assessment Office (TSCAO), in the DLA Office of the Inspector General (OIG), checks the clearance of bidders prior to the release of material and recommends approval to the TSCPO.

The TSC assessment is primarily a manual process from filling out the required forms and preparing management reports to conducting the assessment itself. Data from the DLA Form 1822, End Use Certificate (EUC), package is entered in various government and commercial IT systems that perform industry, commercial, and government checks to evaluate whether an entity or bidder for the material is in good standing with verifiable information and without derogatory or discrepant findings. Results from the assessment process are captured on a spreadsheet or printed for filing. The TSCAO has a 45-day metric to complete an assessment and offer an approval recommendation to the

TSCPO. Given the volume of EUC packages processed on a monthly basis, which vary between several dozen to hundreds, the workload for the TSCAO staff of three employees can lead to inefficiencies and ineffectiveness.

The TSCAO receives DLA Form 1822 and EUC packages from bidders who have purchased material, and then validates and verifies EUC information through various government and commercial systems. The typical materials that require an EUC submission are demilitarized items coded Q (primary end items), B (scrap), or F (restricted items on equipment that can be sold outright). The TSCAO falls under DLA's OIG and possesses the legal and law enforcement authority to access various systems to find derogatory information on a requesting bidder or entity. An assessment of those system checks by a staff of three personnel results in a recommendation to the TSCPO for approval or to issue a denial and debarment.

Joint Certification Program

The United States and Canada entered a relationship, outlined in a 1985 memorandum of understanding, that established the U.S.–Canada Joint Certification Program (JCP). The mission of the JCP is to consult and cooperate on developing common industrial security procedures and technology controls to certify contractors, for each country, for access to unclassified technical data. DoD Directive (DoDD) 5230.25 and the Technical Data Control Regulations outline the policies for disclosing critical technology to the United States and Canada. The DLA Joint Certification Program Office (JCPO), which resides under the DLA J34 Directorate, executes the policies in DoDD 5230.25, certifying commercial entities for access to exportation data, including technical data for items owned or managed by DLA. The JCPO's certification process is performed by JCPO personnel via open-source research, which does not furnish a rigorous assessment of defense contractors requesting access to export-controlled technical data. However, a new policy change is expected to be implemented that will require the TSCAO to conduct assessments for the JCPO prior to certification. This will greatly increase the TSCAO workload without supplying additional manpower for execution.

Chapter 2
Technical Concept and Approach

Concept

This project evaluates the TSC assessment process and finds process improvements through automation in existing DLA systems, integration to external systems, and the introduction of technologies in a new business approach.

Approach

The Trade Security Control Assessment Process Capability Project researched the requirements for an updated TSCAO business process to furnish new business capabilities, incorporating advanced technologies (e.g., bots, machine learning [ML], and artificial intelligence [AI]); recommending technology integration opportunities with DLA, other government, and commercial systems; and developing a high-level business case analysis (BCA) of alternatives and a cost-benefit analysis. LMI identified the following tasks to accomplish these goals:

1. Formulate requirements for a new TSCAO process and business capability.
2. Select quantitative and qualitative metrics to measure project success.
3. Research and map the existing TSCAO system and process.
4. Research government and commercial databases for reporting and interfacing with a commercial off-the-shelf record management software.
5. Define the requirements for the future state process and supporting capability.
6. Research existing or future in-house DLA platforms and tools for the new TSCAO process or system.
7. Create options for the new TSCAO process and supporting capability.
8. Develop a high-level BCA with recommendations, including an analysis of alternatives and cost-benefit analysis.

Data Collection and Analysis

LMI engaged the DLA TSCPO, TSCAO, who actively participated throughout the project. During project execution, the potential effect of additional workload from the JCPO was uncovered, so JCPO was added to the discussion and data collection. However, an analysis of current JCPO processes was outside the scope of the project.

The insight and direction of these offices were essential in the development of solution recommendations. LMI also interviewed personnel from Ritchie Bros./GovPlanet (the contractor executing the disposition process and submission of EUC packages), the General Services Administration (GSA), and the Marine Corps. We interviewed DLA personnel at its headquarters (HQ) in Fort Belvoir, VA, and DLA Disposition HQ at Battle Creek, MI, and external process stakeholders through telephone meetings. In addition to the interviews, a technical working group ensured coordination and communication on the project among DLA and LMI personnel. We used these resources to map the as-is process to understand the current business practices and associated issues to formulate a to-be solution.

Technology Evaluation

Once the issues from the process mapping were found, we researched and evaluated potential software solutions and technology enhancements for the greatest potential benefit to DLA and the TSCAO and JCPO processes. This research included finding tools that DLA already had to implement the solution, and how they could best be transitioned. During the project, we rapidly selected the best solution candidates. With the concurrence of DLA and the stakeholders, we developed a model to test and demonstrate the recommended capability. This experience gave valuable data to form the basis of the BCA.

Business Case Analysis

With the knowledge gained from our research, interviews, and model development efforts, we developed a BCA evaluating three solution options. This effort included qualitative and quantitative benefits and furnishes an estimated return on investment (ROI) should DLA implement any of the solution sets.

Chapter 3
Analysis and Findings of Trade Security Processes

Mapping the Current State

Through our interviews, we created a detailed flow map of the processes and data connections for TSC and JCP processes. Our analysis of the TSC processes are described in detail in Appendix A. Although we did not analyze the JCP processes beyond their effect on the TSCAO, we include their process flow for reference in Appendix B. Even without detailed analysis, reviewing where these two systems overlap offered relevant insights and recommendations for improvement.

Trade Security Controls and JCP Overview

DoD applies TSC measures to prevent unauthorized exports or transfers of DoD export-controlled personal property. These measures are applied throughout the entire lifecycle of DoD export-controlled personal property. The TSC assessment process ensures all transfers of DoD export-controlled property accord with applicable federal statute and regulations. In accordance with DoDI 2030.08, DLA manages the DoD TSC Program and assesses TSCs for DLA and other DoD components.

The director, DLA, is the overall manager of DoD's TSC Program and the implementation of DLA's TSC responsibilities. As part of those responsibilities, DLA performs the following actions:

1. Maintains the DoD TSCPO.
2. Develops supplemental TSC implementation guidance for DoD components.
3. Maintains a DoD TSC training program.
4. Maintains the DoD TSC website as a resource for DoD components to implement TSC policy.
5. Conducts TSC assessments for DLA and other DoD components as requested.
6. Maintains DLA's TSC Enforcement and Investigative Program.

To fully implement DoD's TSC Program, DLA must coordinate with other organizations in DoD as well as other federal agencies, including the Department of State, Department of Commerce, DHS, and the Department of Treasury. Each of these organizations maintains its own systems, databases, and processes for managing TSC. Due to the many stakeholders and the diverse systems and processes of these organizations, the coordination and management of the TSC Program is extremely complex and labor-intensive.

As part of the TSC measures, DLA, through the TSCAO, conducts a pre-award assessment, verifying that the destination, end-user, and end-use of controlled DoD personal property conform to U.S. export-control requirements and regulations The TSC assessment process is manual and uses an inflexible system of record that does not enable the interface and reporting capabilities required by the TSCAO. The system of record lacks the standard capabilities of modern systems, such as records search queries, tailorable reports and metrics, automated feeds of outside data, and generation of preformatted assessment approvals and denials.

Authorities

LMI identified and thoroughly reviewed the following authorities for the TSC Program:

- DoDD 5230.25, *Withholding of Unclassified Technical Data from Public Disclosure*. Establishes policy, prescribes procedures, and assigns responsibilities for the dissemination and withholding of technical data.
- DoDI 2030.08, *Implementation of Trade Security Controls (TSC) for Transfers of DoD Tangible Personal Property to Parties outside DoD Control*. Provides the overall authority to operate the TSC Program and assigns responsibility to all parties involved. The key element of this instruction is that it assigns the DLA director to
  - manage the DoD TSC Program, including maintaining the program office, developing guidance, conducting TSC assessments for DLA and as requested by other DoD components, and maintaining an enforcement and investigative program;
  - ensure all dispositions of DoD export-controlled personal property under DLA's control are executed properly; and
  - provide guidance, training, and assistance to other DoD components in coordination with the Assistant Secretary of Defense (Sustainment).
- DoDI 4160.28, *DoD Demilitarization (DEMIL) Program*. Establishes policy and assigns responsibilities for the DoD DEMIL Program for training, functional oversight, code assignment accuracy, and lifecycle planning.
- DLA Directive Type Memorandum 18-043, *DLA Implementation of Trade Security Controls (TSC) for Transfers of DoD Tangible Personal Property to Parties outside DoD Control*. Establishes DLA policy and assigns responsibility for implementing DoD TSC procedures in DLA. Of importance is the assignment of the
  - director, DLA Logistics Policy and Strategic Programs (J34), with overall program responsibilities;
  - chief, Disposal Policy and Compliance (J349), with direct management control and oversight of the DoD TSCPO; and
  - OIG with maintaining the DLA TSCAO to conduct TSC assessments for tangible personal property and all technical data, technology, and software transfers in support of DLA procurements and maintaining the DLA TSC Enforcement and Investigative Program.
- DLA Instruction 1101, *Trade Security Control (TSC) Assessment*. Establishes the procedures and assigns responsibilities for the execution of the TSC Program in DLA.
- *U.S.–Canada JCP Memorandum of Understanding*. Establishes the JCP to certify contractors of each country for access to unclassified technical data disclosing critical technology.

Operating Environment

As part of our review, we gained an understanding of the TSC operating environment and the roles and responsibilities of the different entities and offices for the TSC assessment process.

The DoD TSC program manager (PM) resides in the DLA J349 organization and executes functional management responsibilities for the DoD TSC Program. The TSC PM is physically located at DLA HQ. In this role, the TSC PM makes the initial TSC qualification decisions based on the assessments by the TSCAO. The TSC PM and his office, however, do not conduct the TSC assessments.

The DLA TSCAO resides in the DLA OIG with DLA Disposition Services in Battle Creek, MI. It is staffed with three investigative analysts. Since the TSCAO falls under the purview of the DLA OIG, it is authorized to assess all DoD export-controlled tangible property for DLA and DoD components. This assessment verifies that the destination, end-user, and end-use of controlled DoD personal property conform to U.S. export-control requirements and regulations. The TSCAO supplies the results of the assessment and its recommendations to the TSC PM for final approval or disapproval. On average, the TSCAO conducts approximately 100 assessments per month. The primary metric they use to track performance is a 45-day processing goal for each assessment, inclusive of both touch time and waiting for replies for requested information.

The JCPO evaluates and certifies defense contractors who have requested access to export-controlled technical data. JCPO certification must be received prior to export-controlled technical data package access for the following:

- DoD solicitations
- Conference attendance
- Symposiums, participation in certain meetings
- Obtaining requests for proposals details
- White paper submissions
- Directly arranged visits.

The JCPO is staffed with 16 individuals who perform certification validations and process approximately 875 certification requests per month, on average. The JCPO’s certification process is performed by JCPO personnel solely via open-source research, which does not furnish a rigorous assessment of defense contractors requesting access to export-controlled technical data. Unlike the TSCAO, the JCPO does not have the investigative authority to conduct its certifications and, therefore, relies on open-source research to grant or deny certifications. To offer greater scrutiny and more thorough assessments of entities requesting access to export-controlled technical data, a new policy will require the TSCAO to assess all contractors requesting JCPO certification. While having the TSCAO perform these assessments will furnish a more rigorous certification process, it will greatly increase the workload of the TSCAO staff.

Major Findings of the Assessment Process

Satisfactory Overall but Process Flow Lacks Automation

The overall TSC assessment process was satisfactory in that it properly executes assessments. The four-phase approach—EUC package submission, administrative review, data entry and system checks, and assessment and analysis—enables the TSC analysts to perform the analysis and supply accurate assessments. No identified improvement could be gained given current resources by adding, deleting, or modifying process steps. The process also catches errors and has appropriate corrective steps in place. That being said, 65 percent of TSCAO submissions from all process sources historically need corrections. These are errors that generally occur outside of the TSCAO and though they are quickly caught and returned for correction, it does negatively impact the office workload, and greatly delay resolution of those submission processing times.

In addition, the lack of automation throughout the process cannot be overstated. The process is cumbersome and relies heavily on repetitive, manual data entry. In processing an EUC package, the same data and information is manually entered at least twice by different individuals. Validation and verification of submitted data for accuracy and completeness is likewise performed manually by personnel using hard copy packages. The quality of packages submitted due to the manual process of printing, signing, scanning and faxing, and emailing affects the assessment process by requiring additional questions, clarifications, and resubmission and contributes to possible errors. Automated entry and crosschecks could greatly help in eliminating those errors before they even reach the TSCAO.

Confusing Package Submission Process

There are two main paths to submit EUC packages to the TSCAO for processing and assessment: 1) via the TSCPO and 2) via DLA Disposition Services. Since all EUC packages are eventually submitted to the TSCAO for processing, it is unclear why there are multiple entry points. In addition, the two offices submit packages to the TSCAO through different methods: one via encrypted email and the other through hard copy.

DLA Disposition Services has no visibility of EUC packages submitted by the TSCPO and TSCPO has no visibility of EUC packages submitted by DLA Disposition Services. From a management perspective, this lack of visibility poses an accountability issue, creates a challenge in developing performance reports to leadership, and could result in process gaps and security risks. An automated solution could provide the tools needed to mitigate those issues.

Duplicative Data Entry and Administrative Reviews

DLA Form 1822 is not an automated form. Manual completion by the bidder presents numerous administrative issues, such as illegible handwriting and incomplete information. EUCs may also be completed via a website entry system, but the forms must be printed out for signature and then scanned for email submission. The different methods of completing the form result in numerous errors that must be corrected before the TSC assessment process can commence. Once the EUC package is received by the TSCPO and DLA Disposition Services, it is transcribed to spreadsheets for tracking before the packages are passed to the TSCAO. When the packages are received at the

TSCAO, the TSC analysts print out hard copies of all packages for the assessments. The analyst then must reenter the information from the hard copy EUC into the DLA Criminal Incident Reporting System (DCIRS) to create a record for the EUC package as well as enter information in multiple systems for the assessment. The same information and data contained from one form is manually entered numerous times by different individuals. This process step not only increases the manual workload for the bidder and the analyst, but it also increases the potential for errors in the EUC package.

Each EUC is administratively reviewed for accuracy and completeness on multiple occasions by multiple individuals in the TSCPO, DLA Disposition Services, and the TSCAO. If errors are detected, then the EUC is returned to the bidder for correction and resubmission. In most cases, these submissions or corrections are performed via email with attachments, but, in some instances, hard copies of the form and supporting document are mailed back to the bidder. In all cases, this initial administrative review is a major choke point in the process, especially when the volume of submissions is unmanageable for a small staff.

Repetitive, Time-Consuming System Checks

The most critical pieces of the TSC assessment process are the various system checks by the TSC analyst to evaluate whether to recommend approval. However, as with the rest of the activities in the process, these system checks are not automated, but instead are manually intensive, requiring repetitive data entry in various systems and databases. For an individual EUC package, an analyst enters the same information in 7–10 different commercial and government systems to perform the checks. This repetitive process is extremely time-consuming and takes an analyst approximately 20–30 minutes per EUC package to complete. The laborious steps include entering the information from the EUC in each system, completing the system checks, and manually downloading the documentation (e.g., PDF files, screenshots). For an administratively complete and accurate EUC package, a TSC analyst completes, on average, 5 assessments per day and 25 assessments per week.

The TECS computer system check process is especially time-consuming: it requires the TSCAO to only submit requests for review monthly. The U.S. Customs and Border Protection (CBP) owns and operates the TECS system. CBP's mission includes the enforcement of the customs, immigration, and agriculture laws and regulations of the United States and the enforcement at the border of hundreds of laws on behalf of numerous federal agencies. TECS allows information exchange to support that mission and is utilized by multiple federal, state, local, tribal government agencies international governments and commercial organizations. However, the current system forces analysts to manually transcribe the EUC information into a spreadsheet for submission, increasing the chances of errors in input and delaying results. Once the results of the TECS check are received, the TSC analysts must manually update each record in the DCIRS.

Manual Analysis and Delayed Final Approvals

Once the systems checks are completed (excluding the TECS check), the TSC analyst conducts a full analysis of the documentation gathered. This process is completely manual and involves the analyst reviewing the documentation for discrepancies, validating information, and cross-checking EUC packages against previous submissions.

On completion of the analysis, the TSC analyst can offer an initial recommendation for approval or disapproval based on the results. This recommendation cannot be made final until the results of the TECS checks are received and validated, and the DCIRS system updated to reflect a final decision.

The analyst manually prepares and issues all documentation, including approval letters or issuances of denial and debarment. Derogatory information resulting from the system checks and validated by the analyst is manually entered in DCIRS. Notifications to TSC supervisors, OIG, and the general counsel on derogatory findings are not automated, but done through emails and phone calls.

Major Findings for JCPO

Addition of JCPO Requirements Will Dramatically Increase TSCAO Workload

A policy change is pending that will require TSC assessments for all JCP certification requests. This change will result in more rigorous validation of entities requesting access to export-controlled technical data as the JCPO does not have the legal or law enforcement authority to access the same government or commercial industry systems that the TSCAO possesses. The JCPO resorts to open-source information from the internet to evaluate a requesting entity's good standing.

While the new policy is a positive change for JCP certifications, it will also dramatically increase the workload for the TSCAO. The three-person TSCAO on average completes 100 assessments per month. If the TSCAO does indeed add JCP assessments, it will result in approximately an additional 875 JCP requests per month, a total of near 1,000 assessments per month. This tenfold increase in workload is unsupportable by the current staffing of the TSCAO and the manual assessment process.

In addition, the JCPO has a 5-working day metric to complete the certification process for requests to access DLA export-controlled data. This metric dates to the initial 1985 memorandum of understanding establishing the JCP and has never been revised. However, this 5-working day requirement does not align with the internal 45-working day goal established by the TSCAO.

Finally, the JCPO application and certification process is also primarily manual and, if automation tools are added to the TSC process, but not the JCP process, this may result in a workflow disconnect, slowing the transfer of information between them and creating more work. When automation is considered for TSC, it should be considered for the full JCP process as well.

Therefore, a number of issues need to be addressed and resolved with the J34-directed coordination between the JCPO and the TSCAO to leverage the systems check capability:

- Reconcile the TSCAO 45-day metric with the JCP 5-day metric to complete the assessment process. Can the JCP metric be revised?
- Are there additional JCP certification criteria that need to be incorporated in the TSC assessment process to uncover red flags?

- Will the TSCAO be staffed adequately to meet the increased workload?
- How are traditional TSC workload and new JCP workload prioritized?

Coordination between the DLA J34, DLA OIG, TSCAO, and JCPO are ongoing, but no date has been set to implement the new policy change to include the JCP workload in the TSCAO.

TSCAO Workload and Performance Management

The TSCAO's 45-working day goal to complete the assessment process is the only metric currently managed. No other performance metrics are captured and on time completion rates are dependent on the volume of submissions, printing, collating, scanning of packages, data entry, and timeliness of receiving system check results. Management reports for leadership are compiled from spreadsheet data or reviewing and compiling filed hard copies of EUC packages. There is no automated management tool to process or prioritize workload and any changes to an analyst's workflow are reactionary based on guidance from supervisory leadership or special requests to expedite. There is no formal method of monitoring workload performance metrics or tracking workload volume. Management reports are manually generated using spreadsheets and filed paper copies of EUC submissions.

- Process tracking
- Priority queues with service level agreements (SLAs).

A simple business process scenario of an employee requesting time off exemplifies how DWA works. In a manual workflow, the employee fills out a form and hands it to the manager. The manager approves or denies, and then the form is stored or forwarded.

In a digital workflow system, the employee makes the request using a web-based form submitted electronically. The manager receives notification electronically and approves or denies the request. The employee receives notification and the request is stored electronically or the next person in the process receives notification of work to be done.

While the manual and digital process accomplish the same goal, the digital one is more efficient. Eliminating the paper form is the first gain. In the manual process, the employee must find the form, fill it out, and physically take it to the manager. If there is a mistake, the process starts over. Then the employee waits with no insight on when or whether the manager has reviewed the request.

In the digital version, the system knows who the employee is, so much of the information (name, ID, etc.) is prefilled. All the employee must do is fill in the dates and submit. The system also validates the date range and, if the time off needs to be approved at a higher level (more than 2 weeks for example), it is routed for approval accordingly. The employee can check on the status of the request and, if it is delayed, won't need to remind the approver because the system does that.

Digital workflows have been in use for decades and were once known as business process automation (BPA). BPA tools worked, but required highly skilled technicians to code the process, and were difficult to maintain and expensive. With the advent of cloud computing and software as a service, several platforms offer no or low code capabilities for creating digital workflows. Platforms, such as ServiceNow, Salesforce, and Pegasystems, enable creation of business applications without the need to write code.

Industry Examples

Pegasystems is firmly focused on application development and offers an application-building platform with studios for business analysts and technical users. Pegasystems, however, does not offer any applications that are prebuilt for a task like ServiceNow and Salesforce do.

Salesforce is the biggest player in this market. What started as a capability to extend and customize its flagship customer relationship management (CRM) product is now available to build applications. Salesforce offers prebuilt solutions on its platform and has a marketplace for third-party applications. However, Salesforce has a few drawbacks. The platform started out as a CRM tool that grew into an application platform, increasing the complexity of building simple applications. Also, Salesforce hosts customers in its cloud. This approach to the system architecture can create extended access outages across large customer sets.

ServiceNow is the fastest growing company in this market space. ServiceNow was created initially as a workflow automation platform to enable citizen developers to create business applications with coding. ServiceNow subsequently built an IT service management solution on the platform, enabling the company to grow to offer many applications that are grouped in suites. ServiceNow allows customers to extend prebuilt applications or create their own. Like Salesforce, ServiceNow has an application store with third-party applications built on the ServiceNow platform. ServiceNow is targeted to large enterprises and, as such, can be cost prohibitive for small efforts.

Robotic Process Automation

Overview

RPA software enables sophisticated users to develop and deploy automation software, known as bots, to emulate the actions of a human interacting with information systems as part of a business process. Computer power users can develop these bots with a few hours of training, eliminating the need for teams of costly software developers to create custom automation software. RPA is non-intrusive and leverages the existing infrastructure of the organization, working with the user interfaces of systems. RPA bots can extract data from documents or emails, log in to web applications, search web applications, retrieve results from those web searches and store them in reports, move files and folders, copy and paste data, fill in forms, etc. Integration of RPA tools in key areas of the assessment process to remove dependence on repetitive and time-consuming tasks will increase efficiency and reduce errors.

Industry Examples

As RPA adoption has grown in government and commercial markets, organizations have increased workflow capacity for existing teams, decreased data entry errors, and reduced the time to complete tasks. According to Automation Anywhere, Juniper Networks implemented RPA to automate portions of its invoice processing practice. This effort led to a 100 percent reduction in the process cycle and a 33 percent reduction in manual labor. UiPath reports that the Department of Work and Pensions (DWP) in the UK used RPA to help clear a backlog of over 30,000 welfare and pension service claims. RPA enabled the DWP to clear this huge backlog in just 2 weeks without hiring additional staff. The DWP estimates that, since implementing RPA bots, it has achieved a 15:1 ROI for the project.

Several RPA vendors furnish RPA software to federal agencies. The three primary vendors are UiPath, Automation Anywhere, and Blue Prism. Each is a robust, capable platform with a mature ecosystem of third-party plug-ins. DLA could meet its goals with any of the three platforms, but UiPath deserves strong consideration. Besides being in the forefront of adoption among agencies, UiPath is already used by DLA for RPA projects, meaning UiPath is approved for installation on DLA computers. Furthermore, DLA has a team that has begun deploying RPA solutions for the agency, with a full end-to-end governance process, which can design and build a UiPath solution for any office in the agency.

Interaction of Workflow Automation and RPA

While DWA and RPA seem very similar, they are different, but complementary, technologies. DWA collects and routes information, while RPA enables processing and analysis of that information. Therefore, in the context of TSC and JCP, DWA is the foundation of any modernizing system, and RPA furnish additional functionality.

Using a real-world example: when ordering from Amazon, the searching, selecting, and ordering are all part of a digital workflow. After the order is placed, automated workflow keeps the consumer up to date on the status and orchestrates the picking, boxing, and shipping of the order. In this process, robots and humans are directed on where to pick the item and box it. The robots and humans may be picking the same item for multiple orders, but they are carrying out the task assigned by the digital workflow.

In the TSC example, the EUC is the order and the workflow is assigning tasks to humans (the TSC office) and bots to gather data about the applicant. The tasks assigned to the bots are the repetitive data gathering that does not need the analytical skills of the TSC team. The bots gather as much information as possible before the workflow system informs the TSC staff that the EUC is ready for input and review. The DWA system manages and organizes the work. The bots execute some of the tasks in that workstream.

Artificial Intelligence

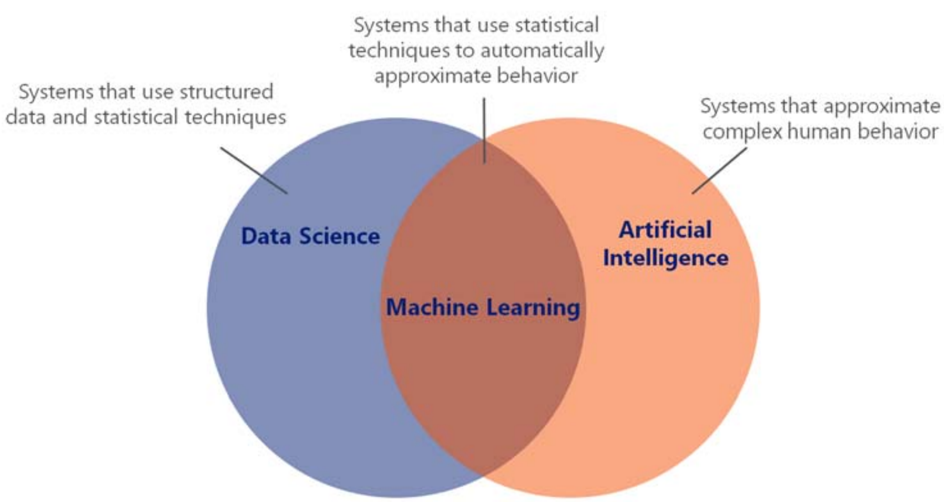
Overview

AI, as explained in the National Defense Authorization Act for FY19, is

> [a]ny artificial system that performs tasks under varying and unpredictable circumstances without significant human oversight, or that can learn from experience and improve performance when exposed to data sets. In the illustration below Artificial Intelligence (AI) capabilities, as delivered through Machine Learning (ML), are derived from access to clean, structured, historical data.

The relationship between AI, data science, and ML are explained in Figure 4-1.

Figure 4-1. Definition and Application of Machine Learning



[1]

Tomorrow's Weather				
Input Types			Prediction Types	
Text	witness report	→ ML →	Class	rain
Image	satellite photo	→ ML →	Probability	60%
Sensor	temperature	→ ML →	Value	3cm

ML is the application of statistical techniques and computing power to build intelligent systems. ML models are tuned by training the models based on historic data—they require well-defined problems where the number and type of observations and possible decisions are stable. While AI solutions can outperform humans at narrow tasks, their true strength lies in processing large amounts of disparate data quickly at low cost. They should be deployed with an understanding of the desired fault tolerance and are more safely used as complements to human decision-making rather than replacements.

Industry Examples

ML models are often used when human auditing is prohibitively difficult or expensive. Classification and ranking models help sort spam email and generate movie recommendations. Using real-time ML auditing, banks uncover fraudulent transactions, and network administrators detect malicious or unapproved traffic. Models guide metrics in higher-order decisions. Using forecast models, retailers predict demand and manage inventory, and the U.S. armed forces forecast maintenance lead times when planning field operations.

Custom ML models can be built using scripting languages. Data scientists often use R and Python; both are open-source languages with excellent support for data formatting, graphing, and modelling, and are designed for usability and quick deployment. These work best when paired with version-control and benchmarking frameworks, such as MLflow and Pachyderm. Because ML models are often part of a broader service, many cloud platforms have begun offering standardized solutions. Microsoft’s Azure, Google’s AutoML, and AWS’s Kubeflow furnish all-in-one management frameworks with several prebuilt models included, ready to deploy with little-to-no server design and provisioning.

These AI techniques are in use by DLA. As a key example, an LMI research and development (R&D) study for DLA used data from several DLA and external data sources to build AI models that improved lead-time accuracy up to 33 percent, with the largest improvements for the hardest to predict, infrequently procured items.

Potential Applications to the TSC Process

The following section offers advanced capabilities for consideration and analyzes the benefits each tool can supply to not only the TSCAO, but also the JCPO as a supported organization in DLA when the new business policy for assessing certification requests is implemented. The section also outlines how DWA, RPA, and AI apply to these business process.

Improvements Using Workflow Automation

The TSC assessment process relies on physically receiving and processing forms and checks as well as manual entry of the data. Implementing digital record management and workflow automation will significantly reduce processing time and lay the foundation for further automation throughout the process.

Information that is currently gathered on paper forms or spreadsheets will be entered in the system by the applicant using an intuitive, accessible web-based portal. Digital collection of the information eliminates dictation and transcription errors and field-level validation will be enforced automatically, ensuring the correct format. For example, the form can validate that an email address is in the proper format on submission. The result is no longer an illegible paper or scanned form but a digital record that moves through a digital workflow process, enabling accurate extraction of data fields for use by other systems, such as RPA tools.

The system manages the lifecycle of a record, and the record moves through multi-step processes automatically, increasing the completeness, accuracy, and efficiency of operational activities. Steps in the process may be serial or happen in parallel. The workflow process may have multiple branches whose gates are triggered by values in the record, data from external systems, or approvals, rejections, or denials.

A step in the process may be performed by a person or automated. In either case, each step of the process offers additional information, approval, or validation which is then recorded. Documents, images, or other artifacts can be attached to the record at any step until the process is complete. The bidder and other interested parties are notified of the status throughout the process, as well as once the workflow is complete.

Throughout the lifecycle of a record, TSC personnel will have visibility of where a record is in the process and can report on the overall workload. Alerts can be established to flag records that may be waiting for input, so they can be rerouted or reprioritized. Managers will see which individuals are over- or under-tasked to better balance workload.

As the record moves through the workflow, the bidder or certification requestor can check the status using the same portal where the request was made. The TSCAO could define which milestones the end user sees. This visibility will reduce emails or phone calls handled by TSC personnel to update end users on their requests.

The digitization of the form data and the workflow process will automatically build a database of information on bidders and certification holders as well as metrics and key performance indicators about the workflows themselves. This data can be used for reporting or fed into AI or ML systems for deeper analysis.

Table 4-1 shows some of the capabilities and features of workflow automation that benefit the assessment process.

Table 4-1. Workflow Automation Process Enhancements

Process task	Automation enhancement
Profile registration	Once bidders and certification requestors create an account and profile, stores the information about the individual or enterprise for any submission that requires it. In addition, as a condition of finalizing registration, executes checks prior to registration approval.
Form digitization	Files and submits digitized forms, such as DLA Form 1822 or DD Form 2345, through an online portal to avoid manual signing and mailing of documents. Features data validation capabilities to ensure every field is completed satisfactorily prior to submission, eliminating administrative review concerns like illegibility and incompleteness.
Access control and visibility	Controls viewing or use of sensitive data, such as Social Security Number, by limiting access to those fields via access control lists.
Secure document transfer	Enables quick and secure transfer of the EUC package between the TSCAO and the relevant agencies for the various checks. Combined with digital form generation, sends Intent to Export and other similar documents.
Process tracking	Maintains visibility on where a bidder’s request is in the assessment process at any time for the TSCAO and the bidder.

Table 4-1. Workflow Automation Process Enhancements

Process task	Automation enhancement
Priority queues and SLAs	Enables the expedition of high-priority requests and bids. Generates alerts if SLA-defined priority queues are not met.
Generation of performance metrics	Includes and produces performance metrics and data visualization tools to observe and identify stressed areas in the assessment process and enable the TSCAO to compare and evaluate the performance of its process against its desired 45-day metric.
Reporting and dashboards	Uses predefined and ad hoc reporting and dashboards for historical bid data and key performance indicators.
PDF generation	Generates PDF or paper copies of the EUC or DD Form 2345 using the filed data stored in the record.
Record archival	Stores or archives current and past bids and their results for reporting purposes and inputs into AI/ML capabilities.

Process Improvements Using RPA

To further enhance the improvements created by DWA, RPA bot augmentation could significantly reduce workload for the analysts compared to their current processes.

Automatic Data Extraction of Incoming EUCs

Once EUCs are submitted via the web-based portal, an RPA bot can extract the data fields from the form, performing more advanced data validation checks than the web form. The bot classifies incoming EUCs as accepted, meaning the fields were filled out sufficiently for further processing, or rejected, meaning there are issues with one or more of the EUC data fields. These rejected EUCs are presented to the analyst for further action or automatically returned to the applicant with specific direction on how to correct the EUC and resubmit. Once data fields are extracted, they are stored in a structured database in preparation for the automatic assessment checks.

Automatic Assessment Checks

An RPA bot can perform checks of the EUC package data which would otherwise be manual labor for the analyst. The bot retrieves the data automatically from the EUC package, then logs in to each of the external systems for the various checks (industry, government, DLA, etc.). Once logged in to each of those systems, the bot supplies the necessary information from the EUC package and retrieves the data from the system. After retrieving the data, the bot enters those results in the structured database, compiles them into a single report, and associates it with the EUC, which is then reviewed by an analyst. This report is sent to the analyst as part of a notification to let the analyst know whether the checks were successfully completed, flagging checks that returned red flags or had missing information. In cases where the bot cannot retrieve the necessary information, the analyst takes manual actions to complete the check. In our discussions with DLA, it was noted that there may be restrictions on RPA access to the type of law enforcement databases the TSC process utilizes, but often there are special access protocols that can be put in place to enable the capability.

Automatic Document Population

RPA bots can prepare the Intent to Export memo, as well as check whether the bidder is on the list of ineligible countries. If the bidder is not on the list, the bot completes the assessment and submits the EUC via DLA Disposition and DLA J-349. If the bidder is on the list of ineligible countries or other red flags are found during the checks, such information is documented in the database and flagged for human review.

Automatic Document Management

RPA can perform automatic document management, such as storing digital copies of submitted EUC packages, digital copies of the Intent to Export memo, and other records associated with all parts of this process. By using RPA bots to prepare and store copies of these documents, the administrative burden on the analysts is reduced, while the bots ensure a level of consistency in file naming and document storage that is difficult to achieve with human, manual filing. As with other RPA bots, any errors encountered in the document management steps are reported to the analysts for human intervention. Table 4-2 captures these potential RPA enhancements.

Table 4-2. Robotic Process Automation Process Enhancements

Process task	RPA enhancement
Automatic data extraction	An RPA bot extracts the data fields from the form, performing more advanced data validation checks than the web form. Once data fields are extracted, they are stored in a structured database in preparation for the automatic assessment checks.
Automatic assessment checks	An RPA bot checks the EUC package data, automatically retrieving the data from the EUC package, logging in to each of the external systems for the various checks, and retrieving the data from the system.
Automatic document population	RPA bots prepare the Intent to Export memo, check whether the bidder is on the list of ineligible countries, and document other red flags in the database for human review.
Automatic document management	RPA bots ensure a level of consistency in file naming and document storage that is difficult to achieve with human, manual filing.

Improved Application Review with AI

AI is not required to implement the current TSC and JCP processes. However, once the workflow and RPA tools have been implemented, AI offers an additional layer of information and crosschecks to aid the analyst in making final application determinations. AI capabilities can compile data from past TSC assessments and external sources (e.g., law enforcement databases) to learn hidden patterns. These AI tools can improve the speed and accuracy of assessments by enabling analysts to focus on those bidders that are most likely to be bad actors. Several AI tools and algorithms may furnish specific capabilities to improve the decision analysis inherent in the TSC assessment as well as offer an added degree of predictive services.

Fuzzy Search

When searching for derogatory information in databases, spelling of names transliterated from other languages is not always consistent. Fuzzy search AI capabilities use permutation rules—each with an associated distance cost—to check the total edit-distance between two pieces of text. For instance, “record” and “recrod” might be a distance of one edit (a letter swap) away from each other. This enables a search to return close matches and results which are likely the same entity, usually in a certain edit-distance of each other.

For example, the International Trade Administration furnishes a Consolidated Screening List (CSL), updated hourly and available by an application programming interface (API). This API uses fuzzy search parameters to search 11 export-screening lists at once. Integrating this API into the TSC assessment process could unlock this AI capability for TSC use.

Sentiment Analysis

Sentiment analysis models are textual analysis tools that score a piece of text as positive, negative, or neutral. As ML models, they are adept at processing and aggregating the scores of large amounts of text quickly. In addition, cutting-edge sentiment models can generate word- and phrase-level scoring, showing how the structure of a document relates to the overall sentiment score. Businesses use sentiment analysis to predict user satisfaction from reviews, and investment firms and intelligence agencies use it with news articles to uncover shifts in public attitudes.

Many law enforcement databases contain textual descriptions of interactions with a potential bidder. With enough labelled training data, ML algorithms can learn the sentiment and relevance of bidder text descriptions to TSC assessment approval. AI can help classify the importance of incident descriptions, saving time by enabling the TSCAO personnel to prioritize database results with the highest probability of revealing derogatory information. This requires manually assigning sentiment scores to a significant number of bidder text descriptions, though pretrained sentiment models can be adapted from similar tasks using transfer learning to retrain with a much smaller training dataset. It would require additional R&D to enable this capability for the TSCAO.

Prediction and Classification

The most powerful application of new advances in AI comes from prediction and classification abilities. While the architecture of these models can vary widely depending on the types of inputs (text, images, sensor data, etc.), target predictions (continuous, categorical), and desired hardware requirements, these models take structured data and forecast a class, a probability, or an estimated value. With access to the TSCAO's historical data regarding acceptances and denials of EUC packages, AI technologies can predict the probability that a bidder is a bad actor or they can offer a best guess at classifying the level of danger a potential bidder poses to national security. This is theoretically possible for the TSC process with the completion of implementing automation workflow and RPA, since the data produced will now be in the required digital format.

Modeling TSC Workflow

To validate these are the appropriate technologies and their potential positive effects, we developed a demonstration using workflow automation and RPA. The software used for the workflow was ServiceNow, and for RPA was UiPath, which DLA currently uses. This model did not cover the entire process, but a representative sample of tasks required:

- Automated data input by TSC staff
- Reduced navigation to a single screen
- Automated assignment distribution of work
- Enabled mass update of records

- Automated retrieval of data from an external site
- Sample dashboards and reports not currently available.

This model was presented to DLA stakeholders for feedback on March 17, 2020. The feedback was positive, with the main technical questions centered on RPA integration into the workflow software. The final consensus was that this capability would benefit the program, particularly in context of the massive increase in workload expected from JCP.

Chapter 5
Business Case Analysis

According to our technology assessment, a combination of workflow automation and RPA should be the backbone of any modernization. However, this conclusion must also make financial and business sense before a final decision. For this BCA, we calculated the cost of the current process, costs to implement automation options, and the resulting cost savings if those solutions were operationalized.

The task of the project was to assess the existing TSC process. During the project, the potential massive impact of the additional JCP workload was discovered. However, given the original scope, and the fact the JCP workload had not yet been fully transferred to the TSCAO at the completion of this project, we have conducted this analysis with two possible end results in mind:

- Case 1: The TSCAO workload does not change from current levels
- Case 2: The TSCAO gains additional workload from the JCPO.

The primary difference between the alternatives is the labor costs, which are broken out in the ROI calculations. For the labor cost calculations, Case 1 labor costs are reflected as the baseline case. The costs for the technology insertion and maintenance are the same for both Case 1 and Case 2, as the addition of the JCP workload does not change the process, only the volume.

Metrics and Results of the Study

To develop the BCA, we needed to baseline the current process workload capacity and the effects of possible future considerations. Understanding the office's total workload capacity provides us with a usable metric to compare across process alternatives. The 45-day metric is based on the expected completion time frame for each assessment, including processing time outside the TSCAO. The office workload capacity metric looks at the touch time required by office personnel, not the overall 45-day metric that includes external processing not completed by the TSCAO. Much of the 45-day timeline is driven by the 65 percent average error rate of submissions, which detracts from the overall office capacity, as additional time is required to identify and return those submissions for correction. Factoring in this error rate, combined with the current throughput of the TSCAO, we calculated a total current workload of about 100 completed assessments each month.

Once the current process workload capacity metric was understood, we examined alternative future workload changes to compare the effectiveness of the alternatives. If the TSCAO incorporates additional workload from the JCPO, this will add an estimated 875 new assessments per month. The summary of the current and possible future workload requirements is captured in Table 5-1.

Table 5-1. TSCAO Monthly Workload

Process status	Workload
Baseline with no JCPO workload	100
Future with the JCPO workload	975

From this analysis, combined with a process time estimate from the TSCAO office, we compared the hours currently required against projected time savings from implementing DWA and RPA. This yielded a projected time savings of 47 percent if DWA was added, and an additional 27 percent if RPA was also implemented. The complete calculations are included in Appendix C.

Analysis of Alternatives

From our technology recommendations, we devised three basic options:

- Option 1: Continue current process and add personnel as workload increases (no technology insertion)
- Option 2: Implementation of DWA
- Option 3: Implementation of both DWA and RPA.

These alternatives all offer workable solutions but vary in approach, cost, and effect. Each is described in context with the expected future for Case 1 and Case 2.

Option 1—Continue Current Process and Add Personnel as Workload Increases

This option assumes that, as workload increases, staffing will be added to meet the new demands. The office is not at its workload capacity for assessments and, under the Case 1 scenario, would not need to increase staffing. In other words, the office would continue to function as it does today, with no enhancements that would improve processing time or assessment quality.

Under the Case 2 scenario, if the current process is continued and no automation is implemented, for the TSCAO to meet the expected increase in assessment workload, increased staffing is required. The three-person staff processes an estimated 100 assessment per month but has capacity for up to 300 assessments per month. If the expected increase of 875 JCPO assessments occurs, the office would require an additional seven employees to meet the new workload requirements. This option meets the expected workload required but adds significant additional cost without decreases assessment process timing.

Option 2—Implementation of Digital Workflow Automation

Implementing DWA reduces the overall TSCAO processing time per assessment by roughly 47 percent. The reduction in process and touch time by employees enables the office to double the assessment completion rate. A complete breakdown of the processing time and time savings attributable to automation is in Appendix C. For both Case 1 and 2, this will result in reduced labor costs. For Case 2, it would reduce the expected future requirement of staff augmentation from seven to three additional employees. However, in both cases, it also incurs implementation costs and some ongoing infrastructure costs.

Option 3—Implementation of Both DWA and RPA

Given the antiquated nature of TSC systems and processes, it is difficult to implement RPA as a standalone solution. Therefore, Option 3 is a combination of DWA and RPA. If built on a DWA structure, implementing RPA improvements reduces overall process time per assessment by an additional 27 percent of the original touch time. This reduction would likely occur after or in tandem with implementation of DWA and create an overall reduced process timeline. The overall reduction in error correction and touch time by the employees enables the office to increase the assessment workload by up to four times its original capacity. For both Case 1 and 2, this option maintains personnel levels from the baseline but incurs implementation costs.

To make sure the options could handle any contingency, we calculated expected maximum volume which is Case 2. Table 5-2 summarizes that expected workload capacity by option, including the baseline of the current workload. Options 1–3 reflect the expected workload increase created by the added JCP assessments in the TSCAO personnel required column.

Table 5-2. Expected Workload Capacity by Option

Alternatives	TSCAO personnel required	User workload per week	Office capacity per week	Maximum capacity per month
Baseline	3	25	75	300
Option 1	10	25	250	1,000
Option 2	6	47	282	1,128
Option 3	3	98	294	1,176

For Case 2, Options 1 and 2 require additional personnel. Option 3 increases the maximum capacity per month to well beyond the expected future requirement. The actual personnel required to meet 1,000 assessments per month would be 2.5 personnel, so we rounded the calculation up to 3 personnel.

Assumptions and Limitations in Calculating Costs, Benefits, and ROI

While every effort was made to keep the BCA realistic, some limitations must be acknowledged.

- Since the project team did not have access to DLA systems, the test modeling was performed on LMI systems. The assumption is that re-creation of these capabilities will be comparable in workload and accessibility. This assumption seemed reasonable from conversations with DLA subject matter experts. This experience helped shape our implementation cost estimates.
- All workloads calculated were based on averages, which may not capture peaks and valleys in workload accurately.

- The system implementation costs will be the same for Case 1 or Case 2 as the process will remain unchanged even if the JCPO workload is added. The only effect of the increased load is a labor cost if not mitigated by automation.
- If the TSCAO begins assessments for the JCPO, it supplies an additional layer of protection for the JCPO process but does not modify the JCPO process itself. Since it was outside the scope of the project, we did not review these processes. However, we recommend DLA consider an additional effort to automate the JCPO processes given the likely tight relationship between the two programs in the future.
- DLA can implement the RPA enhancements using its existing structure and processes, and those labor costs are captured in our estimations. However, additional external transition help might be useful to incorporate lessons learned from this project and assist with the in-process integration of the JCPO.

Estimated Cost to Implement

The costs for implementing each of the options fall under three cost categories:

- Personnel
- Implementation
- Infrastructure.

Personnel costs are based on step 5 pay rates from the Detroit-Warren-Ann Arbor, MI, General Schedule (GS) pay tables effective January 2020. We used the FY20 civilian personnel fringe benefit rate for DLA of 28.8 percent. This rate is calculated based on the FY20 President's Budget for Civilian Personnel Costs. Due to the expected increase in JCPO assessment workload staffing in Case 2, increases are required and would be reduced only by implementing automation from Option 2 or Option 3. The estimated increased personnel costs to meet the future workload demand under Option 1 are shown in Table 5-3.

Table 5-3. Option 1 Personnel Costs

Personnel level	Personnel quantity	Cost	Total annual cost
GS-12	1	$122,977	$122,977
GS-11	3	$102,597	$307,791
GS-9	6	$84,799	$508,794
Total	10	$310,373	$939,562

Note: Annual pay based on data obtained via: https://www.opm.gov/policy-data-oversight/pay-leave/salaries-wages/2020/general-schedule/.

Option 2 costs include the required initial system setup costs to implement DWA and the ongoing infrastructure costs. Because costs can vary widely based on the technical capability of the implementation provider, we calculated our costs in a range from low to high. A more detailed range of costs by labor category is in Appendix C. The implementation costs for Option 2 are in Table 5-4.

Table 5-4. Option 2 Implementation Costs

Cost type	Low end	High end
System setup costs	$234,000	$266,400
Infrastructure costs	$15,847	$21,847
Total	$249,847	$288,247

The yearly infrastructure costs assume DLA will supply its own monthly system maintenance, system upgrades (required yearly), or costs of infrastructure. If a third-party furnished these services, the yearly costs would be about 40 percent higher. Option 2 requires additional personnel costs for Case 2, as seen in Table 5-5.

Table 5-5. Option 2 Personnel Costs

Personnel level	Personnel quantity	Cost	Total annual cost
GS-12	1	$122,977	$122,977
GS-11	2	$102,597	$205,194
GS-9	3	$84,799	$254,397
Total	6	$310,373	$582,568

Note: Annual pay based on data obtained via: https://www.opm.gov/policy-data-oversight/pay-leave/salaries-wages/2020/general-schedule/.

Option 3 costs include the initial system setup costs to implement RPA and ongoing infrastructure costs. Option 3 also includes the costs associated with Option 2 since, in the case of the TSC process, an existing workflow infrastructure is required to properly implement any useful RPA capability. However, costing RPA for Option 3 has some unique considerations. DLA has an existing process to implement internal RPA at no cost to the requesting organization. While this simplifies funding issues, there is still an overall labor cost to DLA. We used estimates from DLA, internal LMI expertise, and experience gained by our TSC modeling efforts to estimate the hours required to implement and then used DLA labor hours to price. However, external help in translating the requirements of the process may still be needed, so we added those hours in as well. These costs can vary widely based on the technical capability of the implementation provider, so we calculated our costs in a range from low to high. A more detailed discussion is in Appendix C. Table 5-6 shows the total implementation costs for Option 3.

Table 5-6. Option 3 Implementation Costs

Cost type	Low end	High end
System setup costs	$304,331	$352,360
Infrastructure costs	$15,847	$15,847
Total	$320,178	$368,207

Option 3, once fully implemented, requires similar personnel requirements as the baseline. To summarize the personnel changes from the baseline for each option, we calculate these costs in Table 5-7.

Table 5-7. Option 3 Personnel Costs

Personnel level	Personnel quantity	Cost	Total annual cost
GS-12	1	$122,977	$122,977
GS-11	1	$102,597	$102,597
GS-9	1	$84,799	$84,799
Total	3	$310,373	$310,373

Under Option 1, using the current TSCAO process with the Case 2 expected increase in JCPO workload requires nearly $600,000 a year in additional personnel costs. Implementing automation under Option 2 and Option 3 significantly reduces or eliminates the need for staff augmentation to meet the future JCPO workload in Case 2. A summary of the costs can be seen in Table 5-8. The system implementation costs are a one-time initial cost to develop the new capabilities and the infrastructure costs are ongoing costs to maintain the systems. For the summary costs, we utilized an average system implementation cost from the tables above and the lower DLA provided ongoing infrastructure support costs.

Table 5-8. Option Summary Comparison

Alternatives	Personnel	System implementation	Infrastructure	Total
Baseline	$310,373	—	—	$310,373
Option 1	$939,564	—	—	$939,564
Option 2	$582,569	$250,200	$15,847	$848,616
Option 3	$310,373	$328,345	$15,847	$654,565

In the ROI section, we analyze how these personnel costs, when applied with the implementation and infrastructure costs of Options 2 and 3, offer a positive ROI for DLA for both Case 1 and Case 2.

Return on Investment

With this understanding of the potential costs for each option, we can calculate the benefits of these options and an overall ROI if DLA implements either automation solution. For a more detailed ROI, additional information and process data would be useful. The assessment process is not recorded, so time stamping is not available for each step. Having the process recorded for each assessment would supply a useful sequence and time data to calculate specific workload and benefits. For this analysis, we created rough estimates for the process timing based on input from the TSCAO and JCPO offices and applied conservative estimates as our expected benefits. Implementing the automation could result in more dramatic time reductions. These benefits, as shown in Table 5-9, will be the same for both Case 1 and 2.

Table 5-9. Automation Project Benefits

Project title	Type of benefit	Value
DWA	• Decreased process flow • Increased assessment capacity	• 47% reduction in touch time • 90% increase
RPA	• Decreased process flow • Increased assessment capacity	• 27% reduction in touch time • 108% increase (when combined with DWA)

TSCAO Workload Return on Investment

For the Case 1 ROI, we used the baseline labor rates and workload. The current TSCAO workload is only 100 assessments per month. The TSCAO informed us that staff can flex to 300 assessments a month, but this would significantly stretch resources and cannot be sustained.

Adding DWA to the processes increases the capacity by 90 percent, reducing the personnel required to only one person to cover the current workload capacity. Thus, implementing Option 2 meets the minimum staffing level possible; implementing RPA would not offer additional cost savings. Therefore, Option 2 results in the best ROI.

We can estimate a conservative ROI if we assume Option 2 is executed and fully successful based on the expected benefits described earlier. Table 5-10 shows discounted benefits. We discount the cost and benefits as money spent today has less value in the future. Benefits are discounted at 1.8 percent, the nominal rate for 7-year U.S. Treasury notes and bonds of specified maturities, with a base year of 2020. The discount period for the cost analysis is 2020–2026.

Table 5-10. Discounted Benefits

Project title	Present value of costs	Benefit value	Starting year[a]	Discounted value
DWA	$329,219	$187,396 annually	2022	$0.9 million

[a] Starting year is the year after the estimated year for implementation; that is, the first year to realize a benefit.

Discounted total planned costs will be $0.33 million (in FY20 dollars). Expected ROI, considering the benefits if both automation options are implemented, is 1.60; for every dollar spent, DLA can expect a return of $1.60 through 2026. This ROI assumes personnel are redeployed to perform other job duties that are no longer under the current TSCAO cost center. It should be noted that adding in RPA implementation costs (Option 3) would still have a positive, but lower, ROI of 1.13.

TSCAO and JCPO Workload Return on Investment

If we consider an ROI including the expected future JCPO workload (Case 2), it increases the benefit of both automation projects. We estimate a conservative ROI assuming Option 2 or Option 3 are executed and fully successful based on the expected benefits described earlier. Table 5-11 shows discounted benefits for Option 2 and Option 3. Benefits are discounted at 1.8 percent, the nominal rate for 7-year U.S. Treasury notes and bonds of specified maturities, with a base year of 2020. The discount period for the cost analysis is 2020–2026. The phased approach is used, assuming the RPA improvements are implemented after the DWA improvements are complete. The benefit value will be slightly higher if they are implemented simultaneously.

Table 5-11. Projected Costs and Discounted Benefits 2020–2026

Project title	Present value of costs	Benefit value	Starting year[a]	Discounted value
DWA	$329,219	$356,995 annually	2022	$1.6 million
RPA	$74,073	$272,196 annually	2023	$1.0 million
Total				$2.6 million

[a] Starting year is the year after the estimated year for implementation; that is, the first year to realize a benefit.

Discounted total planned costs will be $0.40 million (in FY20 dollars). Expected ROI, considering the benefits if both automation options are implemented, is 5.50; for every dollar spent, DLA can expect a return of $5.50 through 2026.

Qualitative Benefits

There are multiple benefits that are not easily quantified when automating a process.

- Data accuracy
- Data transparency
- Integration opportunities
- Process modernization.

Converting the TSCAO process from a manual paper-based system, which may include semi-automated systems like email or manual web crawling, to a fully automated information system will increase data accuracy. Quantitatively, digitizing data results in time savings for replication or verification, but, qualitatively, digitizing data ensures data accuracy as the information is moved from system to system.

Moving to an automated information system also increases data transparency, enabling transactions and records to be summarized, verified, and analyzed more readily. Reports can be generated, and specific details of a process' timing and components can be monitored. Data transparency enables system activity and effectiveness to be shared among stakeholders and even outside the TSCAO. This reduces the need for status reports as users can access activity data easily to verify assessment processing.

Once a process is converted into an information system, the system can be connected to other systems for additional efficiencies not possible when working with disparate system types. Data and transactions can be sent via electronic interfaces to similar systems to retrieve additional information relevant to the processing of assessments.

Possibly the most interesting qualitative benefit of automating a process is the unknown gains in knowledge that can be extracted once the system is operating. Removing manual limitations to a process enables further integration and higher-level information system capabilities, such as decision and expert systems. These processes may not have been identifiable while the system was manual but become evident as the information system becomes active.

One of the side effects of this modernization is the digitization of the data. This can serve as a foundation for modern analytic capabilities not yet explored. For example, we discussed the potential new capabilities that AI could offer this process. AI would not be a viable option without digitization. This may also become critical for the JCPO work with technical data, as that type of information is being transformed rapidly in the commercial sector into 3D digital models.

Risk Analysis

As with any project and system implementation, risks need to be identified and managed throughout project execution. While quantitative benefits enable traditional ROI assessments, qualitative benefits should not be underestimated when evaluating the value of an initiative. In addition, all projects and software implementations have risks. Typical risks that the TSCAO automation project encounter include budget, schedule, scope, security, personnel, and opportunity.

Budget Risk

Budget risk includes the possibility of spending more money than expected during the system implementation or for ongoing infrastructure costs. For Options 2 and 3, while any development effort with software can run into unforeseen difficulties, this transition would be built on well-known commercial platforms that DLA currently uses or has begun to integrate, which minimizes complications that would balloon the budget. We assess this risk to be low.

Schedule Risk

Schedule risk includes delays due to foreseen and unforeseen events. In the case of DLA, prioritization of resources may delay availability of those required to deploy the solution internally. To minimize this risk, the project needs high-level and vocal support from all stakeholders. We assess this risk to be medium.

Scope Risk

Scope risk can occur when tasks and goals are added after project definition. This addition of tasks is sometimes referred to as scope creep and can add unintended costs, delays, and risks. In this case, the TSC process has been well-defined and the process of automation is straight forward if user interface input is obtained early in the process. However, if DLA follows our recommendation to fully automate the JCP process, that scope must be well-defined at the outset. In addition, we assume any AI improvements are a separate effort from this transition. We assess this risk to be low.

Security Risk

Security is the most critical risk in this assessment. Projects that develop an information system with network access must manage the security risks. In this case, public-facing portals will be a new aspect of the TSC process. In addition, our conversations with the DLA RPA subject matter experts identified the interface with the law enforcement databases as requiring special access certificates and procedures that may complicate development and deployment. However, once this new process is in place, it will eliminate other security risks created by using email to transmit data. In addition, DLA has robust security protocols for its systems. As a result, we assess the risk to be low.

No matter the risk level, a system security plan must be developed and monitored via an accredited system test and evaluation process. A system security plan contains an overview of security requirements, describes the controls that are in place or planned, and outlines the responsibilities and expected behavior of all individuals who access the system.

Personnel Risk

The risk associated with personnel can never be underestimated. Having the correct personnel during all phases of the project and ongoing after implementation is critical. In addition, the future state of the TSCAO will require substantial personnel increases if process automation is not implemented. For this reason, the risk is variable depending on the option selected; the more new hires, the greater the risk that they will not perform to expectations. Thus, the risk is highest for Option 1 and virtually non-existent for Option 3.

Opportunity Risk

With any use of limited resources, there is always an opportunity risk. Committing resources to automating the TSCAO processes could prevent other automation projects from occurring or delay their implementation. Providing the required information on the benefits of this project compared to other projects will help leaders prioritize projects and mitigate the opportunity risk. Given the high ROI for this effort, we assess the risk to be low.

Overall Risk Assessment

In sum, none of these risks are uncommon or provide any heightened concern. If properly monitored and managed, the risks can be avoided. To mitigate or manage these risks, a risk plan should be developed along with the project plan once transition has begun.

Improving Risk Assessments inside the TSCAO Process

All the risks discussed focused on implementation risks. However, the overall goal of the TSC process is minimizing risks in the disposition of military equipment. By modernizing the process, new tools, particularly with the eventual addition of AI, will enhance the analysts' identification of potential risks and their early mitigation. In addition, automation can expand visibility to other areas, such as buyer associations and suppliers.

Plan for Future Prototype Development and a Pilot Study

According to our analysis, if the TSCAO remains at current workload levels (Case 1), Option 2 offers the best ROI. However, the qualitative benefits and additional risk mitigation offered by RPA still justify selecting Option 3.

If the addition of the JCPO workload, as described in Case 2, occurs, Option 3 is clearly the best option. For Case 2, we also recommend additional research to fully capture the JCPO processes and include them in the automation work. In either case, DLA would select the workflow and RPA software for deployment. With or without the inclusion of the JCP process, DLA should be able to implement both options with internal resources, although the assistance of a contractor to fully develop the workflow automation might be helpful, depending on the software platform selected. We recommend a phased approach to upgrading DLA systems and processes.

- Phase 1: DWA tool implementation—this is the baseline required to achieve measurable improvements and serves as the foundation for additional RPA work.
- Phase 2 (if needed): incorporating RPA into the business process—while we recommend a solid DWA foundation before Phase 2 deployment, we acknowledge that the best practice is for RPA developer involvement during Phase 1 deployment to find and eliminate complications to their work before implementation.

We also recommend a new R&D project to explore the benefits of adding AI. This project could be combined with the JCPO integration work or as a standalone process. This effort should be conducted in conjunction with the DWA and RPA deployment so the connection points can be built in early, enabling the digitization of data to begin for use by the AI tools.

Chapter 6
Conclusion and Recommendations

The TSC assessment process is an effective, but inefficient, means of verifying the end-user, destination, and end-use of controlled DoD property. The process rigorously validates individuals or entities that seek to acquire DoD property or technical data, preventing the release and unauthorized use of material and data to individuals, entities, or countries unfriendly to the United States. While the process itself is not in need of restructuring, it is manually intensive and fails to take advantage of technology to ensure a more efficient assessment. In addition, the future requirements brought by the Case 2 inclusion of the JCPO assessment and certification requirements will vastly increase workload and further exacerbate the challenges facing the assessment process.

The BCA shows a positive ROI for adding DWA, regardless of any future change in workload. While the return is less if the TSC maintains its current structure and volume, it is still positive. In addition, DWA has several key qualitative benefits:

- Reducing the current 65 percent average submission error rate to near zero
- Enabling new capabilities for management, such as improved metric tracking, real-time visibility, and faster response time for the customers
- Setting up the framework to enable new modern digital capabilities such as AI.

These benefits can be achieved without RPA, but, for a minimal additional investment, an additional 27 percent reduction in touch time can be gained and will further enhance the qualitative benefits gained. If the JCPO workload is added, the ROI increases dramatically through the addition of RPA capabilities.

Therefore, although Option 2 is a viable solution for the current TSC process, we recommend that DLA exercise Option 3, enabling the TSC assessment process to be improved through the following:

- *Implementation of DWA.* To improve the efficiency, timeliness, and effectiveness of the TSC assessment process, a DWA solution should be implemented. Implementing DWA record management will significantly reduce processing time and lay the foundation for further automation throughout the process.
- *Introduction of RPAs into the TSC assessment process.* The integration of RPAs, with a DWA solution to perform such actions as extracting data from documents, logging in to web applications, moving files and folders, copying and pasting data, and filling in forms, can improve process efficiency and productivity by enabling analysts to focus on actual assessment reviews. This is particularly key if the TSCAO absorbs the additional workload of assessments for the JCPO.
- *Further research*. DLA should research using AI to improve the fidelity of the risk assessments of the TSC and JCP processes. This research should be coordinated with J6 and explore tools like fuzzy search, sentiment analysis, and ML to predict or classify bad actors.

Appendix A
Current Trade Security Control Process

The TSC assessment process is primarily manual, incorporating automatically generated reports from various government and commercial systems to validate and verify bidder information contained in DLA Form 1822. The TSC process flow can be broken into four main phases—EUC package submission, administrative review, data entry and system checks, and assessment and analysis. The TSCAO has an internal 45-working day goal to complete an individual assessment. The clock for this goal starts on the day a complete and accurate EUC submission is received.

The JCPO does not have the requisite investigative authorities nor adequate processes to assess the entities requesting access to export-controlled data resident in DLA systems. Once implemented, the new policy initiative will enable the JCPO to leverage the TSCAO assessment capability. It is anticipated the TSCAO will process the JCPO's DD Form 2345, Military Critical Technical Data Agreement, similarly to how it completes DLA Form 1822.

EUC Package Submission

Completion and submission of the EUC package and supporting documentation are the responsibility of the bidder. The complete package includes a properly filled out DLA Form 1822 and supporting documentation consisting of buyer identification, signed DEMIL certification and verification, an authorization letter from the item managing activity, and a sales invoice. The EUC form must include a wet signature, necessitating the bidder to print out the form, sign it, and scan it for submission. Complete packages are submitted in two ways.

1. Submission to the DoD TSC Program Office—The DoD TSCPO accepts and processes completed EUC packages for all packages where a DoD component is selling property to a bidder, usually via a contracted third party, such as Ritchie Bros./GovPlanet. Since a TSC assessment and approval is required before the property can be released, the bidder must complete and submit the EUC package, including DLA Form 1822 and the required supporting documentation, to the third-party vendor who then submits the full package via the DoD Secure Access File Exchange (SAFE) system to the TSCPO for processing. The TSCPO administratively reviews the full EUC package and, if corrections are required, contacts the DoD component or vendor to have the bidder make the changes and resubmit. Once the EUC package is deemed accurate and complete, it is forwarded via DoD SAFE to the TSCAO for assessment and a recommendation for approval or disapproval.
2. Submission to DLA Disposition Services—DLA Disposition Services receives and processes completed EUC packages when a DoD component contracts with DLA Disposition Services to handle the disposition of property on its behalf. DLA Disposition Services has a contract with a third-party vendor, Ritchie Bros./ GovPlanet, to auction this type of property, primarily rolling stock, and submit the required EUC package for TSC assessment. A bidder must initially register with

DLA's Auction Sales website (DLA Disposition Services E-Sales public site) to obtain a Form 805 number. The bidder can then complete and submit the EUC package, including DLA Form 1822 and the required supporting documentation, to the third-party vendor. The major difference in this submission process is that the third-party vendor sends the completed hard copy package (via mail or FedEx) to DLA Disposition Services for processing. DLA Disposition Services confirms the status and 805 number of the bidder in the DLA CRM system and then administratively reviews the full EUC package and, if corrections are required, contacts the vendor to have the bidder make the changes and resubmit. Once the package is deemed complete, it is delivered in hard copy to the TSCAO for processing.

Administrative Review

The TSCAO begins processing all EUC packages by performing an administrative review of the full package, including the supporting documentation, for completeness and accuracy. Packages are reviewed in hard copy form, meaning packages received from the TSCPO via DoD SAFE are printed out in their entirety. The review is a time-consuming process since the packages have been completed electronically or in ink, then printed, scanned, or faxed, which can erode the legibility of the documents.

The TSCAO's administrative review is essentially the same review as those by the TSCPO and DLA Disposition Services for accuracy and completeness. If the TSCAO finds that corrections are needed, it returns the package to the TSCPO via SAFE or sends the full hard copy package back to DLA Disposition Service for return to the third-party vendor. The multiple administrative reviews and potential for returning packages to the bidders for correction and resubmission dramatically slow the TSC assessment process.

Data Entry and System Checks

Once an EUC package is deemed administratively acceptable, then the TSCAO analyst begins data entry and system checks. The process begins with the analyst creating a record by manually entering the data from the submitted EUC form into the TSC portal in the DCIRS, an internal DLA database. The TSCAO has the legal and law enforcement authorization to access various government and commercial systems to verify and validate supplied EUC information. Once the record is created with the applicable EUC information, the TSC analyst commences with these checks. To complete the system checks, the TSC analyst must access various government and commercial systems and databases to obtain the information.

A list of the systems and databases accessed by TSC analysts is below:

- Commercial
  - LexisNexis Accurint
  - Thomson Reuters CLEAR
- Government
  - DoD Defense Central Index of Investigations (DCII)
  - GSA Excluded Parties List

    - CBP TECS
    - Export.gov CSL with access to
        - Department of Commerce—Bureau of Industry and Security
        - Department of State—Bureau of International Security and Nonproliferation
        - Department of State—Directorate of Defense Trade Controls
        - Department of the Treasury—Office of Foreign Assets Control
    - National Crime Information Center.

Results of the system checks are given in real-time and vary from a simple “No Information Found” to a detailed report of a bidder’s address history, possible criminal record, financial information, etc. The TSC analyst downloads the reports from each system and saves a hard copy to perform the TSC assessment and for file keeping purposes.

There are two exceptions to receiving the results of system checks: the DCII and Immigration and Customs Enforcement (ICE) TECS check.

- DCII check: For the DCII check, if a positive finding is received, then the analyst must order the report from the corresponding agency. These reports can take up to 8 weeks to receive due to age of the report (i.e., report has been archived). In this case, the analyst will perform the remainder of the assessment, but will not issue a recommendation for approval or disapproval until the report can be received. This delays a decision on an individual EUC package.
- TECS check: Because of the system requirements for the TECS check, the TSCAO submits a batch request for review on a monthly basis. To accomplish this, the TSCAO compiles the necessary information and submits a spreadsheet to the ICE TECS representative requesting review. This batch request contains between 75–100 individual EUC packages. Results of this request can take 1–2 weeks to receive. However, because the TSCAO submits a batch request for review, waiting on results of the review would negatively impact all the assessments by delaying a recommendation for approval. To mitigate this delay, the analyst issues an initial recommendation for approval.

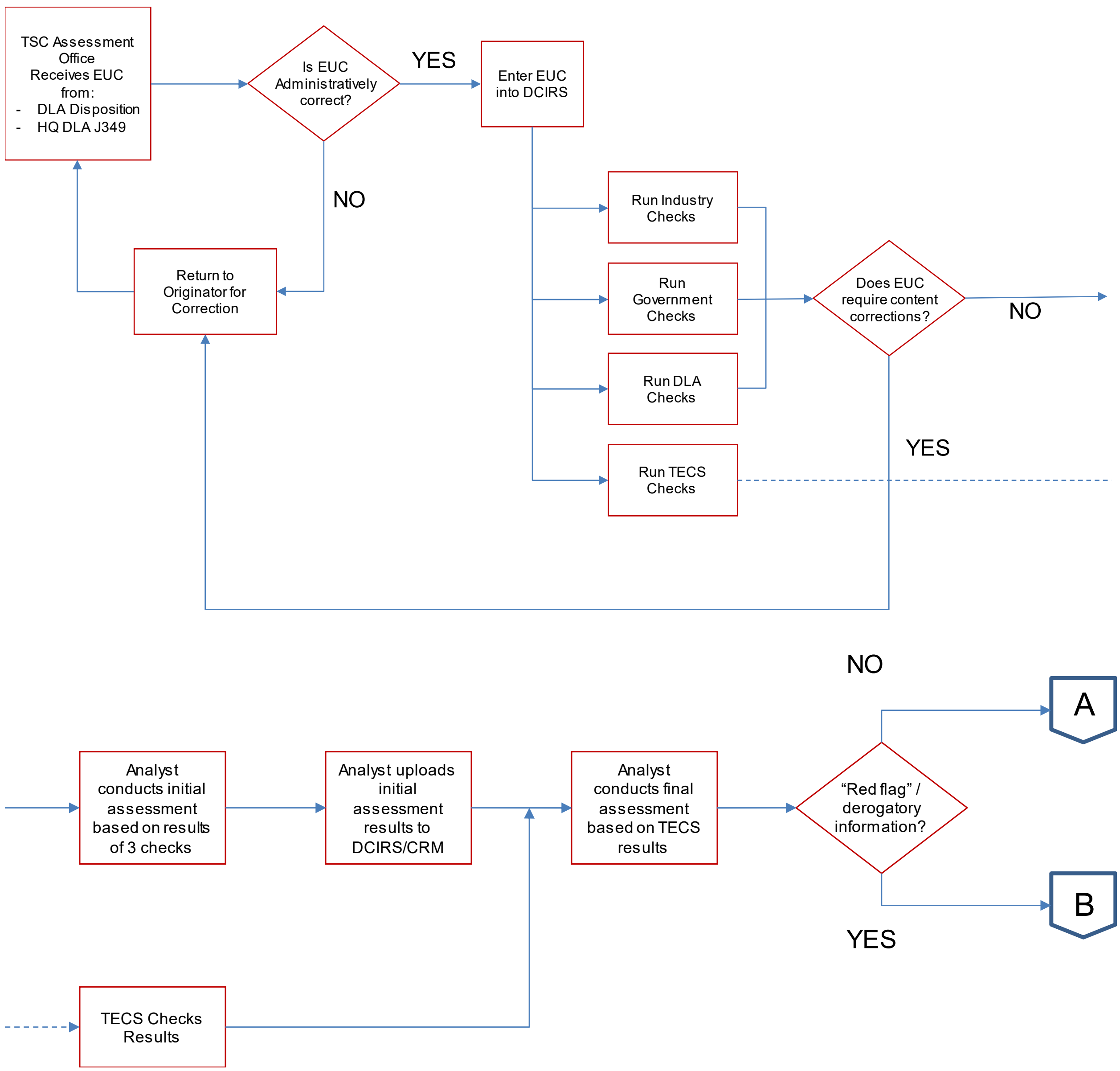
TSC Assessment and Analysis

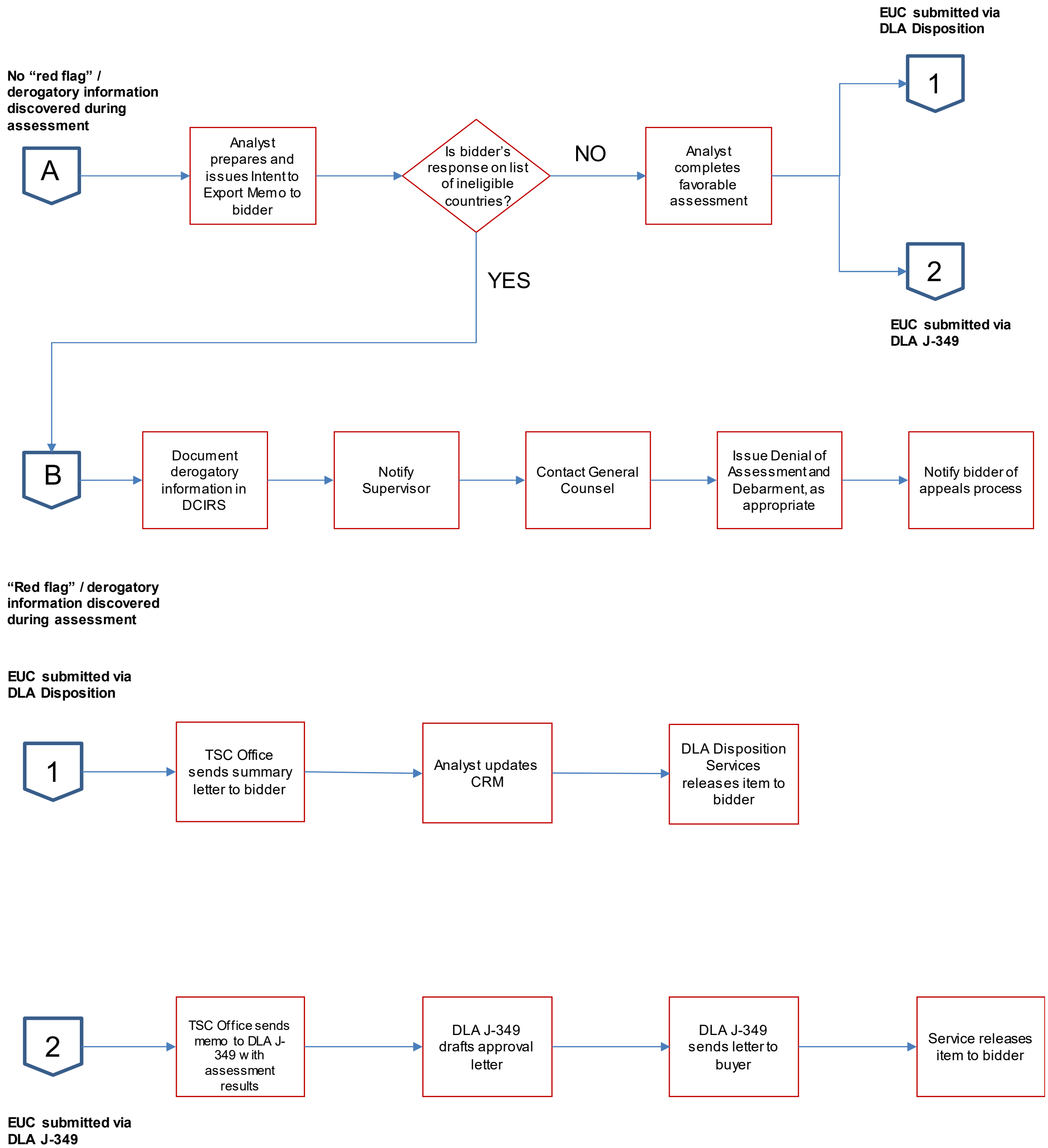
Once the system-generated reports are collected by the TSCAO analyst, the TSC analyst evaluates all the collected information (with the exception of the TECS report). The analyst then updates the record in DCIRS CRM and prepares a temporary favorable assessment recommendation while awaiting the results of the TECS check.

- DLA Disposition Services packages: The TSCAO prepares a summary letter and sends it to the bidder, then updates the DLA CRM system, and DLA Disposition Services releases the material or item to the bidder.
- TSCPO packages: The TSCAO submits its approval recommendation to the TSCPO, which drafts its own approval letter, then sends it to the bidder, and the military service releases the material to the bidder.

If the TECS check returns with results necessitating a disapproval, the TSCAO contacts DLA Disposition Services or TSCPO to process a denial of assessment and debarment and begin retrieving the property through the contract third-party vendor. However, disapproval of an EUC package is rare.

Figure A-1. TSC Assessment Process Flow Map




EUC submitted via DLA Disposition
No "red flag" / derogatory information discovered during assessment
A
Analyst prepares and issues Intent to Export Memo to bidder
Is bidder's response on list of ineligible countries?
NO
Analyst completes favorable assessment
1
2
EUC submitted via DLA J-349
YES
B
Document derogatory information in DCIRS
Notify Supervisor
Contact General Counsel
Issue Denial of Assessment and Debarment, as appropriate
Notify bidder of appeals process
"Red flag" / derogatory information discovered during assessment
EUC submitted via DLA Disposition
1
TSC Office sends summary letter to bidder
Analyst updates CRM
DLA Disposition Services releases item to bidder
2
TSC Office sends memo to DLA J-349 with assessment results
DLA J-349 drafts approval letter
DLA J-349 sends letter to buyer
Service releases item to bidder
EUC submitted via DLA J-349

Appendix B
Joint Certification Program Process

When this project was initiated, it focused on the TSC process only. However, when it was discovered that the TSCAO would soon receive additional workload from the JCPO, this impact needed to be captured, which necessitated that we understood the JCPO process as well. However, due to the scope of the project, we did not perform a detailed analysis of the JCPO efficiency, just a cursory review of its effectiveness. We have included its process flow for reference.

The JCPO processes close to 1,000 DD Form 2345, Militarily Critical Technical Agreement, requests for access to DLA technical data on a monthly basis. The JCPO does not have an automated process to manage the workload nor any legal or law enforcement authority to assess the entities submitting DD Form 2345. There are 20 JCPO personnel, of which, 16 perform the certification process, using open sources on the internet to verify the information submitted by a requesting entity contained in DD Form 2345. The JCPO has a 5-day metric to complete the processing of a DD Form 2345 submission and approve the requesting entity. The completion rate for processing DD Form 2345 in a month has been as low as 3 percent with 1,085 forms categorized as overdue of 1,214 submitted. DLA J34 has directed the JCPO to leverage the TSCAO assessment capability to address the ineffective open-source method of verifying and validating DD Form 2345 information. This executive-level guidance will result in a significant TSCAO workload increase for an under-resourced and manually driven process.

The DLA J34 JCPO was established under a 1985 memorandum of agreement with the Canadian Department of National Defence and receives its Office of Secretary of Defense–level guidance from the Defense Technology Security Administration. DoDD 5230.25 and the Canadian Technical Data Control Regulations outlines control measures for critical technology with military or space applications. Requests for such technical data requires a submission of DD Form 2345 to the JCPO. The JCPO then reviews and certifies for access to the technical data, but only via a manual, open-source process. The JCPO does not use the TSCAO to conduct more detailed, rigorous assessments of entities that have requested access to export-controlled technical data.

A September 30, 2019, DoD OIG report, *Results Brief—Audit of Access Controls in the Defense Logistics Agency's Commercial and Government Entity Code (CAGE) Program,* highlighted a concern about the effectiveness of DLA's control and management of the CAGE process in supplying contractor access to export-controlled data on DLA systems, specifically the Collaboration Folders or "C" Folders. The report stated

> the DLA JCP did not limit access to export-controlled data, as required by DoD policy. For example, the DLA JCPO approved contractor requests for access to export-controlled data without requiring the contractor to provide a detailed and specific rationale for requesting access. Access to export-controlled data allowed unauthorized contractors to view, download, and share unclassified military technical data with unauthorized parties. Unauthorized contractors could use information to replicate military equipment or technology for improper purposes. For example,

according to DoD policy, unauthorized access to these data could make a significant contribution to the military potential of another country and harm the security of the United States.

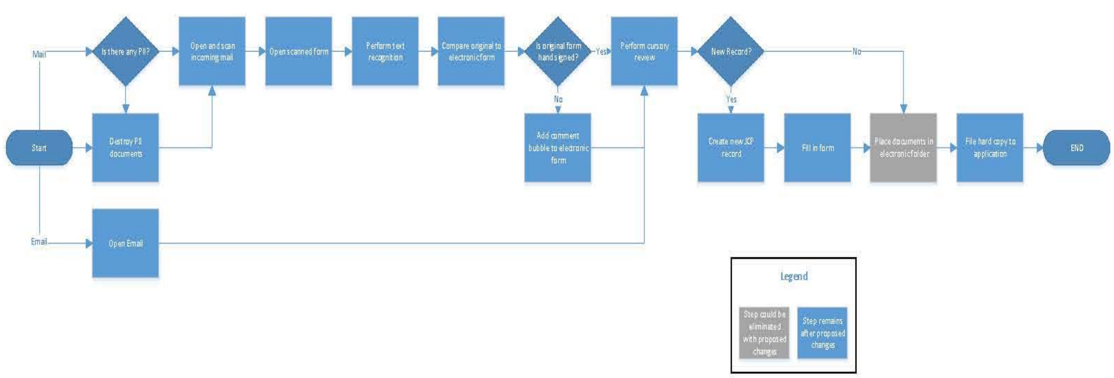
As a result of this audit, a policy change was put forth to require the JCPO to use the TSCAO to conduct assessments as part of its certification process. This policy change, which is planned for the near future, will greatly increase the number of assessments conducted by the TSCAO.

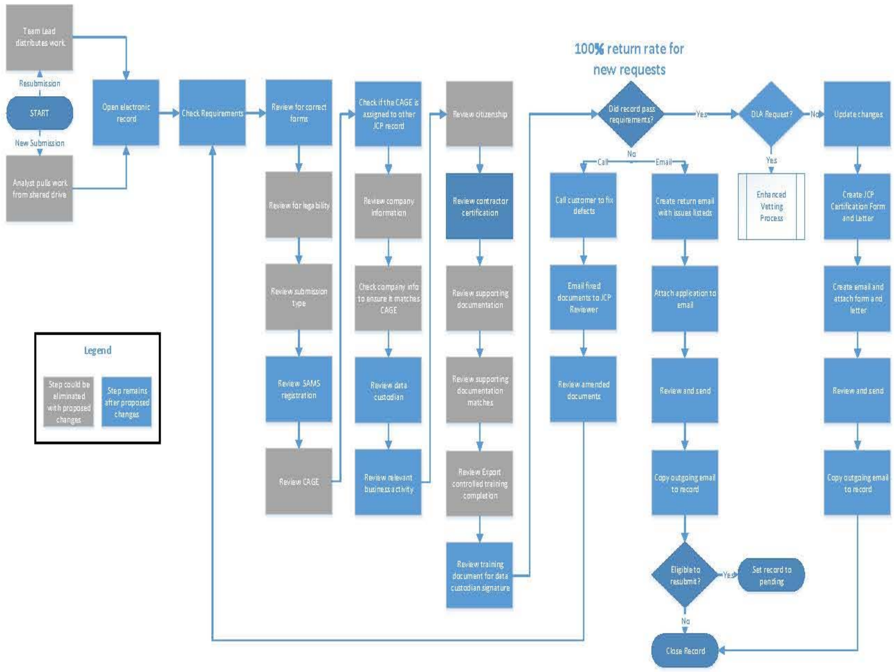
The JCPO process is also primarily manual, incorporating the use of open-source information to verify data submitted in DD Form 2345 by a requesting entity. The JCPO process flow maps (Figure B-1) can be broken into three main phases—package submission and administrative review, assessment and enhanced vetting, and award and approval. The JCPO has established an internal 5-working day goal to complete the assessment and approval process. The clock for this goal starts on the day a complete and accurate EUC submission is received.

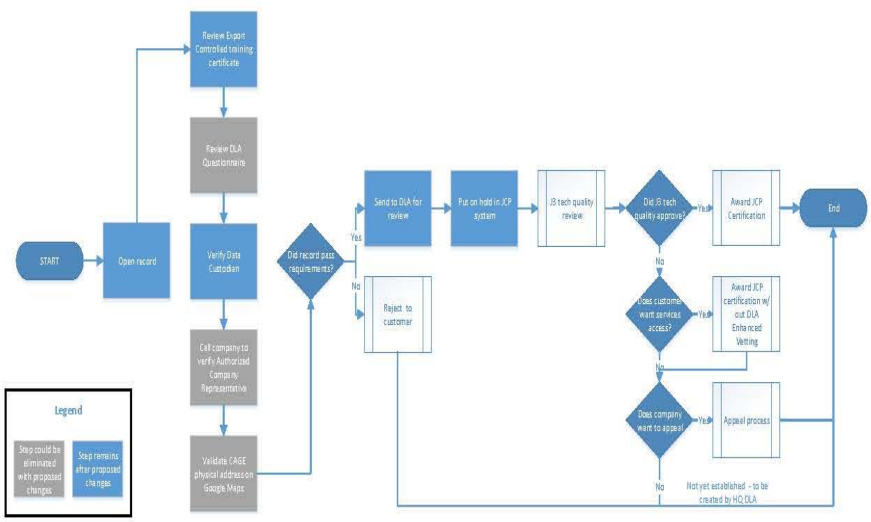
DD Form 2345 Submission and Approval Process

Requesting entities submit a DD Form 2345 through email or regular mail. An initial cursory review is conducted by an analyst to ensure hard copies are signed and a record of a new submission is created in the JCPO files. The administrative review ensures that the required content in the DD Form 2345 is complete and, of most importance, that the export-control training is annotated as completed. If discrepancies are found, the analyst calls the requesting entity to correct the discrepancies or returns the form with identified discrepancies for resubmission. If the form is deemed to pass all requirements, then the form is forwarded for enhanced vetting. The requirements to pass the enhanced vetting is to verify the requesting entity's authorized representative and validate the CAGE physical address of the requesting entity on Google Maps. Once enhanced vetting is completed, the DD Form 2345 package is sent to the HQ DLA J34 Technical Quality Section for review and approval for a JCP certification and access to the exportable data files.

Figure B-1. JCPO Process Flow Maps




Team Lead distributes work
Resubmission
START
New Submission
Analyst pulls work from shared drive
Open electronic record
Check Requirements
Review for correct forms
Review for legability
Review submission type
Review SAMS registration
Review CAGE
Check if the CAGE is assigned to other JCP record
Review company information
Check company info to ensure it matches CAGE
Review data custodian
Review relevant business activity
Review citizenship
Review contractor certification
Review supporting documentation
Review supporting documentation matches
Review Export controlled training completion
Review training document for data custodian signature
100% return rate for new requests
Did record pass requirements?
Yes
No
Call
Email
Call customer to fix defects
Email fixed documents to JCP Reviewer
Review amended documents
Create return email with issues listeds
Attach application to email
Review and send
Copy outgoing email to record
Eligible to resubmit?
Yes
Set record to pending
No
Close Record
DLA Request?
Yes
Enhanced Vetting Process
No
Update changes
Create JCP Certification Form and Letter
Create email and attach form and letter
Review and send
Copy outgoing email to record
Legend
Step could be eliminated with proposed changes
Step remains after proposed changes


START
Open record
Review Export Controlled training certificate
Review DLA Questionnaire
Verify Data Custodian
Call company to verify Authorized Company Representative
Validate CAGE physical address on Google Maps
Did record pass requirements?
Yes
No
Send to DLA for review
Put on hold in JCP system
J3 tech quality review
Did J3 tech quality approve?
Yes
Award JCP Certification
End
No
Reject to customer
Does customer want services access?
Yes
Award JCP certification w/ out DLA Enhanced Vetting
No
Does company want to appeal
Yes
Appeal process
No
Not yet established - to be created by HQ DLA
Legend
Step could be eliminated with proposed changes
Step remains after proposed changes

Appendix C
Business Case

Assessment Process Timing

To create the benefit analysis for the business case, we needed to understand the current process and develop a workload comparison for the automation options. Because the current process is manual, accurate and detailed process timing data is not available. We created rough estimates of process step processing time to calculate overall touch time by the TSCAO office. With these time estimates, we calculated the expected benefits of the DWA and RPA implementation options. Table C-1 shows an overall average processing time of 73 minutes for each assessment. This is not a continuous process, but with delays between steps due to external party processing of information. Each process step is an average or a range depending on the issues related to each step in the current process. For example, the TSCAO estimated roughly 65 percent of assessment packages are provided with incorrect information that needs to be corrected by the submitter. The “Admin Review” process takes about 3–5 minutes to confirm this information and with the DWA this step would prevent incorrect data via automated form control. If both automation options are implemented, we could see a reduction down to 18.5 minutes per assessment. Additionally, we have calculated the benefit attributable to each automation option. If both automation options are implemented, this time could be reduced to 18.5 minutes per assessment. In addition, we calculated the benefit attributable to each automation option.

Table C-1. Rough Estimates of Processing Time and Savings (in minutes)

Assessment process step	Current process time	Current process average time	Proposed process average time	Time savings DWA	Time savings RPA
1—Admin review	3–5	4	0	4	0
2—Enter EUC into DCIRs	3–10	6.5	0	6.5	0
3—Total checks	15	15	2.5	0	12.5
4—Initial assessment	20–30	25	10	7.5	7.5
5—Final assessment	5	5	5	0	0
6—Prepare letters and submit	15–20	17.5	1	16.5	0
Total	61–85	73	18.5	34.5	20

It is important to note the process timing per assessment does not directly imply workload given in an 8-hour workday. The process times are only estimates of time spent on the assessment and TSCAO personnel have additional duties beyond the steps that are not attributable to the assessment process. Time savings attributable to DWA represent a 47 percent decrease in touch time from the current 73-minute average.

Time savings attributable to implementing RPA will reduce the process an additional 20 minutes, representing an additional 27 percent reduction in processing time.

Detailed Automation Implementation Costs

To create the estimated costs for each automation option, we developed project cost estimates. The DWA cost estimate is based on an outside provider developing the system for DLA. An estimated range is given as developing a specific estimate is impossible without a statement of work. Table C-2 shows the estimated personnel costs for implementing DWA and furnishes an average cost utilized for the cost-benefit analysis to calculate the ROI. Additional infrastructure costs need to be considered during and after implementation of the selected automation solutions.

Table C-2. Estimated Personnel Cost for Implementing DWA

Labor category	Low hours	Low cost	High hours	High cost	Average hours	Average cost
Architect	120	$22,200	120	$22,200	120	$22,200
Business Analyst	120	$13,800	120	$13,800	120	$13,800
Developer	960	$135,600	1,200	$168,000	1,080	$151,800
Project Leader	240	$33,600	240	$33,600	240	$33,600
Tester	240	$28,800	240	$28,800	240	$28,800
Total	1,680	$234,000	1,920	$266,400	1,800	$250,200

The RPA cost estimate is based on an outside provider assisting in the development of the system for DLA, but the actual implementation of the software solution would be provided by DLA as would the required software for implementation. A range is given as developing a specific estimate is impossible without a statement of work. Table C-3 shows the estimated personnel costs for implementing RPA and averages cost utilized for the cost-benefit analysis to calculate the ROI.

Table C-3. Estimated Personnel Costs for Implementing RPA

Labor category	Low hours	Low cost	High hours	High cost	Average hours	Average cost
Government Business Analyst	59	$2,876	72	$3,515	65	$3,196
Government Developer	693	$31,307	847	$38,265	770	$34,786
Government Project Leader	198	$11,667	242	$14,260	220	$12,964
Provider Developer	180	$18,000	220	$22,000	200	$20,000
Provider Project Leader	43	$6,480	53	$7,920	48	$7,200
Total	1,173	$70,331	1,433	$85,960	1,303	$78,145

Appendix D
Abbreviations

AI	artificial intelligence
API	application programming interface
BCA	business case analysis
BPA	business process automation
CAGE	Commercial and Government Entity Code
CBP	U.S. Customs and Border Protection
CRM	customer relationship management
CSL	Consolidated Screening List
DCII	Defense Central Index of Investigations
DCIRS	DLA Criminal Incident Reporting System
DEMIL	demilitarization
DHS	Department of Homeland Security
DLA	Defense Logistics Agency
DoD	Department of Defense
DoDD	DoD Directive
DoDI	DoD Instruction
DWA	digital workflow automation
DWP	Department of Work and Pensions
EUC	end use certificate
GS	General Schedule
GSA	General Services Administration
HQ	headquarters
ICE	Immigration and Customs Enforcement
IT	information technology
JCP	Joint Certification Program
JCPO	Joint Certification Program Office
ML	machine learning
OIG	Office of the Inspector General
PM	program manager

R&D	research and development
ROI	return on investment
RPA	robotic process automation
SAFE	Secure Access File Exchange
SLA	service level agreement
TSC	trade security control
TSCAO	TSC Assessment Office
TSCPO	TSC Program Office

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