SYM-AM-26-091

Excerpt from the Proceedings

of the

Twenty-Third Annual Acquisition Research Symposium and Innovation Summit

Wednesday, May 6, 2026 Sessions

Volume I

"Accelerating Warfighting Capabilities"

Augmented Acquisition: Operationalizing Human-in-the-Loop AI to Accelerate Warfighting Capabilities

Published: April 30, 2026

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

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Augmented Acquisition: Operationalizing Human-in-the-Loop AI to Accelerate Warfighting Capabilities

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Dylan Mrla—is a Product Manager at Eudia and a United States Air Force veteran. He drives product strategy and development across Eudia's platform, with direct ownership of the company's defense acquisition vertical. Dylan has emerged as a transformational leader in applying emerging AI technology to highly regulated workflows, drawing on his firsthand experience as a warranted Contracting Officer to deeply understand how to augment human talent. During his active-duty service, Dylan served as Deputy Director of the Operational Contract Support Integration Cell for Combined Joint Task Force Operation Inherent Resolve, coordinating contracting operations across Kuwait, Iraq, Syria, and Jordan in direct support of combat operations. Stateside, he oversaw complex test and evaluation contracting. His experience at the strategic, enterprise, and operational levels of the acquisition process were critical for this research. His unique combination of domain knowledge and AI product expertise positions him at the forefront of efforts to modernize high-level professionals through human-centered technology, particularly in defense acquisition. Mrla holds a BA in Management from Michigan State University's Eli Broad College of Business, where he was recognized by his undergraduate student body as the honored commencement speaker.

Abstract

Contracting officers are the backbone of delivering mission-critical advantages to the warfighter, responsible for navigating thousands of pages of regulatory guidance across the Federal Acquisition Regulation (FAR) and its sub-regulatory supplements while producing accurate, defensible, and timely acquisition packages. Beyond regulatory complexity, contracting professionals must manage massive volumes of contract data across the enterprise and at the squadron level while often simultaneously operating across multiple disconnected systems to accomplish a single task. The acquisition process itself spans numerous stages, from requirements development through pre-solicitation, solicitation, pre-award, and award, each with distinct documentation and compliance demands.

Compounding these challenges, requirement owners frequently delay timelines of critical acquisitions due to poorly defined or incomplete requirements, a key area where AI can provide meaningful augmentation. As the Department of War accelerates efforts to deliver warfighting capability at the speed of relevance, the acquisition workforce faces mounting pressure to reduce Procurement Acquisition Lead Time (PALT) without sacrificing compliance or accountability. The

leading approach to address these challenges with cutting-edge AI technology is to combine human input with artificial intelligence to significantly enhance the productivity of high-performing personnel.

This paper investigates an alternative paradigm: human-centered AI that augments contracting officer judgment rather than replacing it. The proposed approach positions AI as a copilot that reviews, validates, and enhances human-generated content in real time, enabling acquisition professionals to reach their maximum capacity for production while retaining full ownership of every decision. Our research is grounded in an active research and development (R&D) contract with the 39th Contracting Squadron (39 CONS) at Incirlik Air Base, where Eudia is developing and evaluating an augmented acquisition capability comprising three integrated applications: Insights, Sigma, and Augmented Contract Review (ACR). The system reviews human-generated acquisition documents against structured training data drawn from the FAR, DFARS, DAFFARS, internal policy, and historical contract files, providing clear citations, plain language explanations of regulatory risks, and structured feedback that strengthens document quality and compliance confidence.

Through testing, we estimate PALT reductions varying by acquisition type—with simpler actions such as Simplified Acquisition Procedures under $250,000 showing different improvement rates than complex Source Selection efforts. Preliminary findings indicate that human-in-the-loop AI reduces document error rates, accelerates regulatory review, and supports workforce development by reinforcing training concepts and surfacing relevant guidance for junior personnel. This research contributes to the symposium's focus on accelerating warfighting capability by demonstrating that the fastest path to contract award is not replacing human judgment but amplifying it.

Keywords: Defense acquisition, human-centered AI, augmented intelligence, contracting officer decision support, FAR compliance, DFARS compliance, DAFFARS compliance, Procurement Acquisition Lead Time, PALT reduction, human-in-the-loop AI, acquisition workforce, regulatory compliance, warfighting capability, 39th Contracting Squadron, document validation, AI copilot, acquisition acceleration.

Introduction

The Department of War acquisition enterprise faces an enduring imperative: deliver warfighting capabilities to the field faster than adversaries can adapt. Yet the contracting process governed by the Federal Acquisition Regulation (FAR) and its sub-regulatory supplements remains one of the most labor-intensive functions in the defense enterprise. While the defense budget and volume of acquisition requirements have expanded significantly, the size of the acquisition workforce has not grown proportionally. Contracting officers must navigate thousands of pages of regulatory guidance, produce extensive documentation across multiple acquisition phases, and ensure every action can withstand audit scrutiny and legal challenge. This work is performed while managing massive volumes of historical contract data, operating across disconnected information systems, and coordinating with requirement owners whose input quality directly impacts acquisition timelines.

The manual nature of acquisition documentation creates significant bottlenecks. Contracting professionals currently cross-check documents against regulatory checklists through tedious, line-by-line review. They search for precedent across filing systems that may contain years of institutional knowledge but lack intuitive retrieval mechanisms. They validate clause selection, citation accuracy, and justification language through processes that are both time-consuming and susceptible to human error. As the Department of War accelerates its push toward rapid capability deployment, these people-intensive compliance workflows struggle to keep pace, introducing delays that directly impact mission readiness.

The challenge extends beyond the contracting office. Defining requirements is challenging, particularly in higher-intensity mission environments. When requirement owners

struggle to articulate their needs, contracting officers must interject during the requirements development stage which can add days or weeks to Procurement Acquisition Lead Time (PALT). Pre-solicitation activities and documentation each present opportunities for error or delay. Across every stage of the acquisition life cycle—requirements development, pre-solicitation, solicitation, pre-award, and award—a significant gap exists between the speed at which the enterprise must operate and the capacity of the current workforce to produce compliant, defensible documentation while achieving contract award timelines comparable to commercial industry.

Artificial intelligence presents an opportunity to close this gap, but how AI is implemented matters profoundly. Approaches that seek to fully automate document generation such as producing market research reports, sole source justifications, or pricing memorandums with minimal human involvement other than prompting introduce risks that may ultimately slow rather than accelerate acquisition. When AI generates entire template documents, questions arise about explainability, auditability, and the statutory accountability that warranted contracting officers bear for every action they sign. The most promising path forward is not automation that replaces human judgment but augmentation that amplifies it.

Research Context and Scope

This paper presents findings from an active research and development effort to operationalize human-in-the-loop AI within defense acquisition. Eudia is a Silicon Valley–based technology company founded in 2023 with the mission of augmenting humans at the world's most important organizations to achieve their full potential. In 2025, Eudia was selected for a Direct-to-Phase II Small Business Innovation Research (SBIR) contract by the United States Air Force to develop AI-augmented acquisition technology for the 39th Contracting Squadron (39 CONS) at Incirlik Air Base in Türkiye. Eudia's selection underscores the company's track record of working hands-on with elite organizations to build the next generation of high-productivity, human-centered workforces.

The 39 CONS engagement serves as the primary operational testing environment for this research. As an operational contracting squadron, 39 CONS executes a diverse portfolio of contract actions supporting base operations, providing an authentic environment where AI tools must perform under real-world conditions with actual mission consequences. The research team embedded directly with contracting personnel to understand workflow pain points and document quality challenges and opportunities for AI augmentation. This collaboration culminated in the successful deployment of multiple operational prototypes that validated a core hypothesis: human augmentation represents the future of AI in defense acquisition.

To ensure the research captured perspectives beyond operational contracting, the team conducted extensive discovery sessions with mission partners across the acquisition enterprise:

- Space Systems Command (SSC): Examining utility in systems acquisition and complex program management environments
- Office of the Chief of Space Force Contracting: Understanding service-level contracting policy and strategic priorities
- Air Force Test Center (AFTC): Assessing application to test and evaluation contracting with specialized technical requirements
- Headquarters Air Force Materiel Command (HQAFMC/PK): Exploring major command contracting policy and oversight considerations

- Air Force Life Cycle Management Center Armament Directorate (AFLCMC/EB): Aligning with program-level acquisition strategy and policy direction

These engagements validated that the challenges observed at 39 CONS—regulatory complexity, disconnected systems, requirement quality issues, and the need for faster compliance validation—exist across the acquisition enterprise. They also confirmed that human-centered AI, properly implemented, could address these challenges in contexts ranging from operational contracting to systems acquisition and Other Transaction Authority (OTA) contracting motions. Beyond the Department of War, the research team met with the offices of 13 members of Congress, where there was shared recognition that the federal acquisition process is a critical problem that is ripe for innovation. The consistency of this perspective from flight-level contracting offices to the halls of Congress demonstrates that acquisition modernization is a systemic imperative. This broad alignment creates a compelling case for human-centered AI as a solution that meets both operational needs and strategic policy objectives.

Research Objectives

This research investigates how AI systems designed to amplify the throughput of a human asset can meaningfully accelerate defense acquisition while maintaining the compliance, transparency, and accountability the process requires. The study examines Eudia's Unified Platform, which comprises three integrated applications:

- **Contract Insights**: enables natural language queries against historical contract and market research data, displays relevant contract information in an organized tabular view that automatically refreshes, and creates a contracts dashboard filterable by DODACC.
- **Projects**: supports requirement owners in producing higher-quality inputs to the contracting process and allows end-users to query against historical requirement and contract data.
- **Augmented Contract Review (ACR)**: provides real-time compliance validation and risk identification for human-generated acquisition documents.

The sections that follow present the regulatory and operational context for this research, describe the methodology employed, detail the technical implementation of the Eudia platform, and report preliminary findings on PALT reduction, document quality improvement, and workforce development benefits. The paper concludes with implications for broader adoption of human-centered AI across the defense acquisition enterprise.

Figure 1 illustrates the Sigma application interface, designed to support requirement owners in developing higher-quality inputs to the acquisition process. In defense acquisition, the quality of requirements directly impacts every downstream activity from market research and solicitation development to source selection and contract award. When requirement owners struggle to articulate clear, complete, and compliant requirements, contracting officers must intervene to clarify intent, identify missing information, and reconcile inconsistencies. These iterations add weeks or months to Procurement Acquisition Lead Time before the formal contracting process even begins and often during.

It is important to note that Sigma and the broader Eudia platform are designed to feed insights into the human review process, not replace it. The goal is to improve the effectiveness of both requirement owners and contracting professionals while allowing human experts to focus on judgment calls, strategic decisions, and mission alignment. In short, augmenting human effort through AI reduces risk in acquisition programs by ensuring that potential issues

are identified early, best sources are determined with maximum efficiency, and the documentation gauntlet is executed quickly, all while preserving human authority over every decision point. Delays and compliance issues can surface at many stages of the acquisition life cycle. Department of War policies drive requirements but also shape acquisition strategy, market research, solicitation structure, evaluation criteria, and contract administration. When regulations require specific processes, clauses, or documentation standards, these must be accurately reflected across all relevant acquisition documents. The complexity of this regulatory environment combined with the volume of actions a contracting squadron must execute creates significant opportunity for AI augmentation.

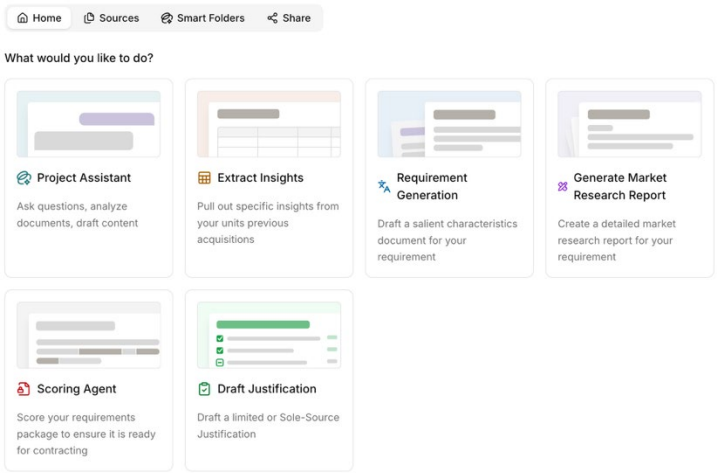

Figure 1: Eudia's Sigma Projects User Interface

Table 1 presents baseline Procurement Acquisition Lead Time data provided by the Air Force Test Center (AFTC). These figures represent target timelines for various acquisition types and illustrate the scope of the challenge. Even modest percentage reductions in these lead times, when applied across hundreds of contract actions, translate directly into faster delivery of warfighting capability at lower cost to the taxpayer. Early estimates suggest that integrating the Eudia Unified Platform at scale could reduce average operational contracting squadron PALT by approximately 31%, and that is just with initial roll out. The platform gets smarter through usage.

Table 1: Average PALT Across AFTC

Acquisition Type	Lead Time (Days)
Simplified Acquisition Procedures (SAP) (FAR Part 13 < $350K)	30
Simplified Acquisition Procedures (SAP) (FAR subpart 13.5 > $350K)	180
Contracting by Negotiation (Non-Competitive) (FAR Part 15)	180
Source Selection (FAR Part 15 Competitive)	240
Broad Agency Announcement (BAA)	270
General Service Administration (GSA) (FAR Part 8)	30
Small Business Innovative Research (SBIR) Phase II	90
Delivery Orders (DOs) – Non-Negotiated	30
Task Orders (TOs) – Firm Fixed Price/Cost	75/180
Change Order (13A, SF30) – Non-commercial	60

Administration (13B, SF30)	10
Supplemental: Time Extension (13C, SF30)	30
Supplemental: Change to Value (13C, SF30)	120
Supplemental: All Others (13C, SF30)	30
Other: Incremental Funding (13D, SF30)	10
Other: All Other Authority (13D, SF30)	10

Driving Human-Centered AI into the Acquisition Life Cycle

Human-centered AI represents a fundamental shift in how artificial intelligence is deployed within high-stakes professional environments. Rather than positioning AI as an autonomous decision-maker that generates outputs for human approval, human-centered AI positions the human as the primary actor and AI as a force multiplier that enhances human capability. This is achieved through structured training and an iterative development approach in direct partnership with operational users. In the context of defense acquisition, this distinction carries significant implications for compliance, accountability, and operational effectiveness.

Three core principles define human-centered AI in acquisition:

- Augmentation over Automation. The fundamental mindset that AI is best utilized to enhance human productivity rather than replacing human judgment. For example, rather than generating a sole source justification from scratch, the AI reviews a human-drafted justification and identifies missing regulatory citations, incomplete market research references, or language that may not withstand audit scrutiny. The contracting officer & requirement owner retain ownership of the document while benefiting from comprehensive compliance validation that would otherwise require hours of manual cross-referencing.
- Explainability and Transparency. Every recommendation or finding produced by Eudia includes clear citations to regulatory authority and plain-language explanations of why something may constitute a risk. When the system flags a potential issue such as a missing clause or an inconsistency between the statement of work and the evaluation criteria, the contracting officer can immediately understand the basis for the finding and make an informed decision about how to proceed. This transparency is essential for maintaining audit trails and defending contracting decisions.
- Human Authority and Accountability. Eudia advises but never decides. Warranted contracting officers hold statutory authority to obligate government funds, and this authority cannot be delegated to a machine. Human-centered AI preserves the contracting officer's role as the final decision-maker while providing them with capabilities that exceed what any individual could accomplish alone. Every recommendation can be accepted, modified, or rejected based on the contracting officer's professional judgment.

These principles are essential in an environment where the consequences of error are significant. A missing clause can result in a bid protest. An incomplete justification can trigger audit findings. A poorly defined requirement can delay contract award by weeks or months. Human-centered AI addresses these risks not by removing humans from the process but by ensuring that humans operate at their maximum capacity.

Table 2: How Human-Centered AI Maps to Key Stages of the Acquisition Life Cycle

Acquisition Stage	Human Activity	AI Augmentation Value
Requirements Development	Requirement owner defines the need	Sigma validates completeness, identifies ambiguities, and flags language that may cause downstream issues
Market Research	Contracting officer researches potential sources	Insights surfaces historical precedent, similar acquisitions, and relevant market data from past contract files
Pre-Solicitation	Contracting officer prepares solicitation documents	ACR validates clause selection, citation accuracy, and regulatory alignment in real time
Solicitation	Contracting officer issues and manages solicitation	Insights enables rapid response to industry questions using historical Q&A patterns
Evaluation & Pre-Award	Contracting officer evaluates proposals and prepares award documentation	ACR reviews pricing memoranda, source selection documentation, and justifications for compliance risks
Award	Contracting officer executes award	ACR provides final compliance validation before signature

Exploring Human-Centered AI for Acquisition Compliance

Exploring specific examples provides important insights into the opportunities and current capabilities of human-centered AI in defense acquisition regulatory compliance. Through our Direct-to-Phase II SBIR contract with the 39th Contracting Squadron, we have developed and tested the Eudia Unified Platform in an operational environment, processing real acquisition documents against the FAR and its sub-regulatory supplements. Although testing and refinement continue, our initial results demonstrate significant potential for AI to augment contracting professionals across the acquisition life cycle.

The Eudia Unified Platform comprises three integrated applications, each designed to address specific pain points identified through direct collaboration with operational users:

Insights enables contracting officers to query historical contract data and regulatory guidance using natural language. Rather than manually searching through years of contract files, shared drives, and policy memoranda, contracting personnel can ask targeted questions and receive contextually relevant answers with citations to source documents. This capability transforms institutional knowledge previously locked in filing systems or the memories of career professionals into an accessible, searchable resource. Sigma supports requirement owners in developing complete, compliant, and clearly articulated requirements before they enter the formal contracting process. By identifying ambiguities, missing information, and language likely to cause downstream issues, Sigma reduces the iterations between requirement owners and contracting officers that frequently delay acquisition timelines. Augmented Contract Review (ACR) provides real-time compliance validation for human-generated acquisition documents. As contracting officers draft market research reports, sole source justifications, pricing memoranda, and other deliverables, ACR reviews the content against the FAR, DFARS, DAFFARS, local policy, and historical precedent. The system identifies missing clauses, citation errors, incomplete justification language, and potential compliance risks each finding accompanied by regulatory citations and plain-language explanations.

A common use case illustrates the value of this approach. When a requirements owner prepares a sole source justification under FAR Part 6, they must document specific statutory authorities, demonstrate that requirements are not unduly restrictive, and provide evidence that

market research was conducted. Traditionally, this requires cross-referencing multiple regulatory sections, reviewing historical justifications for similar actions, and manually validating that all required elements are present. ACR performs this validation in real time, flagging gaps or risks while the document is being developed rather than during peer review or legal review when corrections are more costly and time-consuming.

Table 3. Examples of Compliance Issues Identified by the Eudia Platform Across Different Acquisition Document Types

Document Type	Issue Identified	AI Finding and Explanation
Sole Source Justification	Missing market research citation	The justification references market research but does not cite the specific report or date. FAR 6.303-2 requires documentation of market research supporting the sole source determination.
Market Research Report	Incomplete source consideration	The report identifies three potential sources but does not document why two were determined non-responsive. FAR Part 10 requires documentation of sources considered and rationale for narrowing the competitive pool.
Award Documentation	Missing required clause	The contract does not include FAR 52.204-25 (Prohibition on Contracting for Certain Telecommunications). This clause is required for all contracts exceeding the micro-purchase threshold.

Enterprise Portfolio Intelligence: A Critical Capability Gap

Through collaborative discussions with stakeholders at the Air Force Test Center and Space Systems Command, and Air Force Materiel Command, a critical insight emerged: contracting squadrons are among the most data-rich organizations in the federal government, yet they have almost no clear ways to leverage that data usefully. Every contract action generates documentation: requirements, market research, solicitations, proposals, evaluations, awards, modifications, and closeout files. Across an enterprise, this represents millions of data points containing institutional knowledge about pricing, performance, sources, compliance patterns, and risk indicators. Yet in practice, this wealth of information remains largely inaccessible, trapped in disconnected filing systems and individual memories.

The pain points identified across stakeholder engagements were remarkably consistent. Leaders described misaligned expectations between contracting offices and requirement owners, resulting in rework and delays. They noted the difficulty of tracking obligation rates and financial risk such as contracts requiring incremental funding across a portfolio of hundreds of active actions. They spoke candidly about overworked and undermanned contracting shops being asked to do more with less, without tools that provide meaningful visibility into workload distribution, bottlenecks, or emerging risks. And they acknowledged that despite years of investment in contracting information systems, squadron leadership often lacks a real-time, consolidated view of portfolio health.

These findings were not derived from policy documents or external reports but from direct conversations with acquisition professionals across the enterprise. From operational squadrons to major command headquarters, stakeholders articulated the same gap: contracting organizations are drowning in data but starving for insight. What leaders need is not another system that generates reports but a capability that transforms raw data into actionable intelligence with real-time visibility into portfolio health, proactive risk identification, and decision-quality information available on demand. The Insights dashboard within the Eudia Unified Platform was designed to address this exact need.

The research confirmed that what acquisition leaders need is not more data but more intelligence: the ability to see across their portfolio in real time, identify risks before they become problems, and make informed decisions about resource allocation and priorities. This is precisely the capability that the Insights dashboard within the Eudia Unified Platform was designed to deliver.

Repository Awareness Through Natural Language Query

A foundational challenge in acquisition is accessing institutional knowledge. When a contracting officer begins work on a new requirement, relevant precedent almost certainly exists somewhere: a similar contract awarded 2 years ago, a justification that addressed comparable circumstances, a set of clauses used for a parallel requirement. But finding that precedent requires knowing where to look, having time to search, and recognizing relevance when it appears. In practice, contracting officers often start from scratch because locating historical examples takes longer than simply recreating the work.

The Insights AskAI capability addresses this challenge by enabling natural language queries against a squadron's complete contract repository. Rather than constructing Boolean searches or navigating folder hierarchies, contracting personnel can ask questions in plain language: "What justification language did we use for sole source IT services last year?" or "Which contracts with this vendor have had performance issues?" or "Show me examples of market research reports for similar supplies." The system retrieves contextually relevant results with citations to source documents, transforming years of institutional knowledge into an accessible resource. This capability has immediate practical value. Junior contracting officers gain access to the collective experience of the organization, accelerating their development and reducing reliance on senior personnel for routine guidance. Experienced officers save time on research, freeing capacity for higher-value activities. Peer reviewers can quickly validate whether a document aligns with organizational precedent. And leadership can query the repository to understand patterns: how the FSR support for LPWS systems were contracted last time it was competed, which requirement types consistently experience delays, or where compliance findings have historically concentrated.

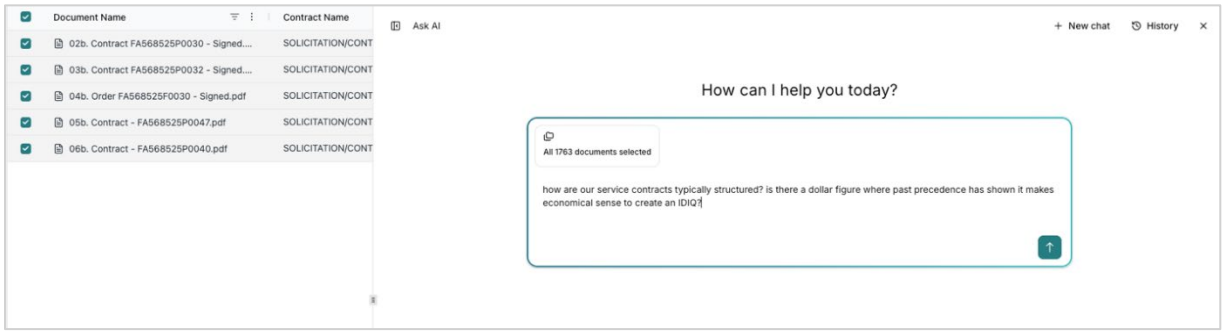

Figure 2: Insights AskAI Interface – Natural Language Query Capability

Portfolio Oversight Through Real-Time Dashboard

Beyond document-level queries, acquisition leaders require portfolio-level visibility. The Insights dashboard provides a consolidated, real-time view of contracting operations, displaying key metrics that enable informed decision-making and proactive risk management. As illustrated in Figure 3, the dashboard presents critical portfolio indicators including total obligations, contract ceiling values, active indefinite delivery vehicles and at-risk contract identification. Additionally, the dashboard is filterable by DODACC, customizable, and deployable with live data. Leadership can immediately see the distribution of spending by unit, identify top industry partners by obligation volume, and understand concentration risk across the vendor base. The system tracks unique contracts, categorizes actions by product service code (PSC), and highlights contracts flagged for risk such as those approaching ceiling limits, requiring incremental funding, or exhibiting performance concerns.

This portfolio-level intelligence addresses a gap that stakeholders consistently identified: the inability to see the forest for the trees. Individual contracting officers manage their assigned actions, but squadron leadership often lacks a mechanism to aggregate that information into actionable intelligence. The dashboard transforms raw contracting data into visual insights that support resource allocation, risk mitigation, and strategic planning. Critically, this capability exists today within the Eudia Unified Platform. It is not a future development or conceptual recommendation but an operational tool validated through the research engagement.

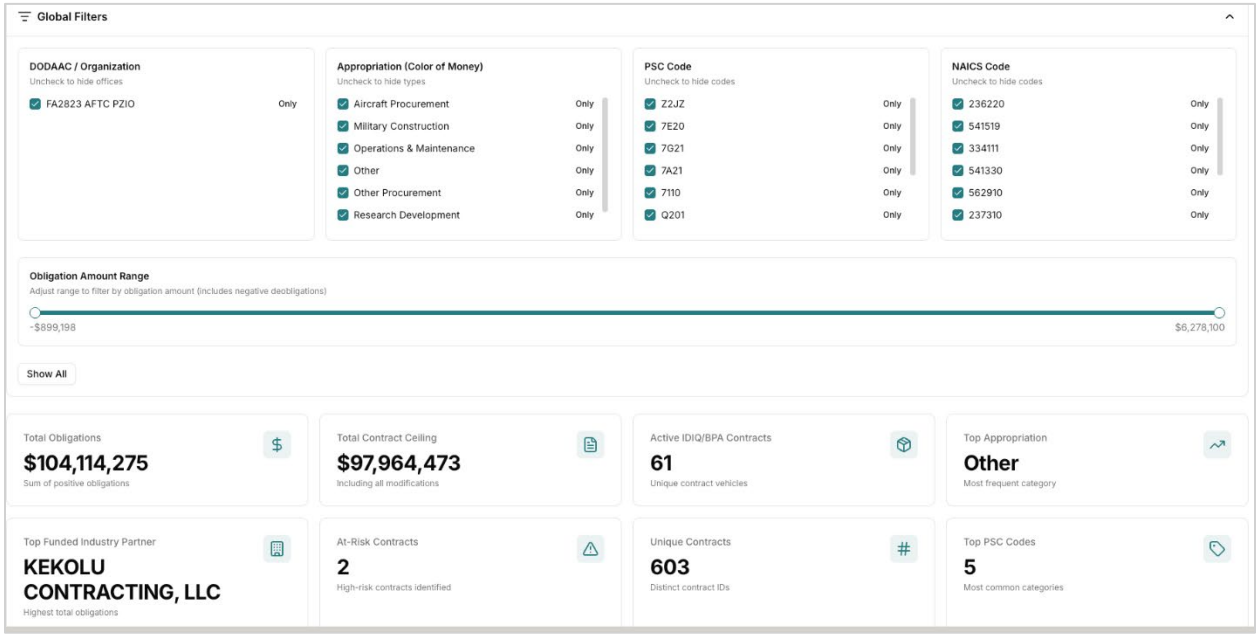

Figure 3 Insight's Portfolio-Level Intelligence Dashboard

Implications for Acquisition Workforce Productivity

The combination of document-level query capability and portfolio-level dashboard intelligence represents a significant advancement in how contracting organizations can operate. Rather than spending hours searching for precedent, contracting officers can retrieve relevant examples in seconds. Rather than manually compiling status reports from disparate sources, leadership can access real-time portfolio views on demand. Rather than discovering risks reactively when a contract approaches its ceiling or a vendor underperforms, the system surfaces potential issues proactively.

This is the essence of human-centered AI: not replacing the judgment of acquisition professionals but providing them with capabilities that allow them to operate at maximum productivity. The contracting officer still makes every decision. The flight chief still sets priorities. The squadron commander still owns risk. But each operates with better information, faster access, and clearer visibility than previously possible. The research indicates that these capabilities, deployed at scale, have potential to fundamentally change acquisition workforce productivity. When contracting professionals spend less time searching and more time analyzing, less time compiling and more time deciding, the entire acquisition enterprise moves faster. Requirements reach contract sooner. Warfighters receive capability earlier. And the acquisition workforce, which is often cited as overworked and undermanned, gains capacity without adding headcount.

Research Results

By April 2026, this research reflects approximately 5 months of operational data, user feedback, and system performance metrics gathered through the ongoing R&D contract with the 39th Contracting Squadron at Incirlik Air Base. While full multi-month impact analyses will continue over the period of performance, the early results demonstrate clear evidence that human-centered AI improves both the speed and quality of contracting workflows without replacing contracting officer judgment or statutory accountability.

The following sections present findings organized around the four research questions that guided this study.

Research Question 1: What regulatory, audit, and risk management gaps emerge when acquisition workflows move toward full automation?

Through interviews with acquisition professionals across the enterprise, from operational contracting squadrons to major command headquarters, this research identified significant concerns about automation-first approaches to AI in acquisition.

The most frequently cited gap involves explainability. When AI systems generate acquisition entire documents, contracting officers cannot fully explain the rationale behind the language produced. This creates vulnerability during audits, bid protests, and legal reviews, where contracting officers must defend not only what decision was made but how and why it was made. Automation-first approaches shift the burden of explanation from the document creator to a system that cannot be questioned or held accountable. A second gap involves statutory accountability. Warranted contracting officers hold legal authority to obligate government funds, an authority that cannot be delegated. When AI generates documents for human signature, the contracting officer's role shifts from decision-maker to reviewer. This inversion may satisfy procedural requirements but undermines the substantive judgment that warrants are intended to ensure. Multiple stakeholders expressed concern that automation-first approaches could erode professional expertise over time as contracting officers become accustomed to accepting AI outputs without critical evaluation.

A third gap involves auditability and documentation integrity. Acquisition documentation must demonstrate a clear chain of reasoning from requirement to award. AI-generated documents may produce plausible language without the evidentiary foundation that auditors require. When findings emerge, contracting officers may struggle to explain AI-generated content they did not author, creating compliance risk rather than reducing it. These gaps do not suggest that AI has no role in acquisition. Rather, they indicate that how AI is implemented matters profoundly. Human-centered AI designed to augment rather than replace addresses these gaps by keeping the contracting officer in the decision-making seat while providing capabilities that enhance their effectiveness.

Research Question 2: How can an AI-augmented, human-in-the-loop approach be structured to provide real-time review, risk insight, and compliance validation within contracting workflows?

This research developed and validated a three-application structure that addresses distinct needs across the acquisition life cycle while maintaining human authority at every decision point.

Sigma addresses the upstream challenge of requirement quality. By providing AI-augmented support to requirement owners as they develop statements of need, the system reduces ambiguity and incompleteness before requirements enter the formal contracting process. This intervention point is critical: delays caused by poorly defined requirements cannot be recovered downstream, making early augmentation essential to PALT reduction. Augmented Contract Review (ACR) provides real-time compliance validation as contracting officers develop acquisition documents. Rather than generating documents for human review, ACR reviews human-generated documents and provides structured feedback including regulatory citations, risk explanations, and recommended corrections. The contracting officer retains full ownership of the document while benefiting from comprehensive validation that would otherwise require hours of manual cross-referencing. Figure 4 illustrates the ACR interface, showing how findings are presented with clear citations and actionable guidance. The specific review shown in Figure 4 was done on a contract award. In second ACR generated a document-based risk assessment and flagged missed clauses, out of scope clauses included in the contract, and incorrect fill-in language, and made recommendations for changes to the CLIN structure. Each risk is shown in the side view and allows the user to easily click and see the source of the citation that is driving a flagged risk. This enables users to upskill through usage.

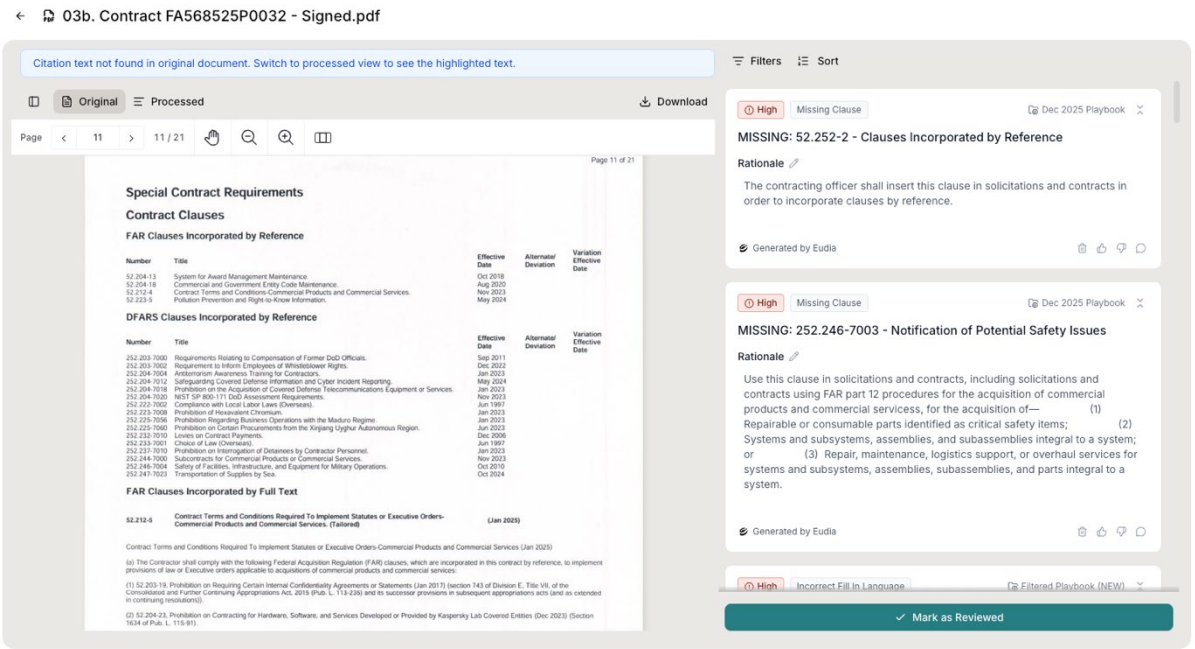

Figure 4 ACR: Augmented Contract Review

Insights provides both document-level query capability and portfolio-level intelligence. The AskAI feature enables natural language queries against historical contract data, transforming institutional knowledge into an accessible resource. The dashboard provides real-

time visibility into portfolio health, obligation tracking, and risk identification. Together, these capabilities support both individual contracting actions and organizational decision-making.

The key structural principle across all three applications is that AI advises while humans decide. Every finding can be accepted, modified, or rejected based on professional judgment. Every recommendation includes explanation sufficient for the contracting officer to evaluate its validity. And every decision remains the responsibility of the warranted officer whose signature obligates the government.

Research Question 3: What measurable impact can this type of system produce when deployed in an operational environment?

Preliminary measurements indicate meaningful impact across multiple dimensions:

Procurement Acquisition Lead Time Reduction. Early indicators suggest that human-in-the-loop AI reduces several time-intensive components of the acquisition workflow, including compliance review, clause validation, and document preparation. Through testing, we estimate PALT reductions varying by acquisition type—with simpler actions such as Simplified Acquisition Procedures under $350,000 showing potential reductions of [31%], while more complex Source Selection efforts show potential reductions of [43%]. Initial modeling of the Eudia Unified Platform deployed at scale projects a potential 34% reduction in average PALT across operational contracting squadrons. As additional base actions are processed through the system, we expect to further quantify reductions attributable to improved document accuracy, fewer rework cycles, and faster regulatory alignment.

Improved Document Accuracy and Consistency. Initial system logs show that the AI reviewer consistently detects missing clauses, misaligned citations, incomplete justification language, and regulatory conflicts in human-generated documents. Contracting personnel report that structured feedback and regulation-linked explanations help them correct issues earlier in the process when corrections are least costly. Early evidence indicates reduced error rates in key document types including market research reports, sole source justifications, and award documentation.

Increased Compliance Confidence. User feedback from 39 CONS indicates that contracting officers value clear, citation-based explanations outlining why a document section may create regulatory risk. This transparency improves confidence in both the final product and the decision-making process. Contracting officers report feeling more confident defending their work during peer review, legal review, and potential audit because they can trace every element to regulatory authority.

Workforce Development Benefits. Preliminary findings suggest the system supports junior contracting officers by reinforcing training concepts, surfacing relevant regulatory guidance, and demonstrating how experienced personnel reason through contract documentation. Rather than replacing professional development, human-centered AI accelerates it, providing real-time coaching that helps less experienced personnel develop judgment more quickly.

Research Question 4: How does the ingestion of historically awarded contract data influence contracting officer decision-making, compliance behavior, and workflow speed?

The Insights platform's ability to query historical contract data has demonstrated significant influence on contracting workflows. Contracting officers report that access to organizational precedent changes how they approach new actions. Rather than starting from scratch or relying on personal memory, they can quickly identify similar prior actions, review successful approaches, and adapt proven language to new circumstances.

This capability accelerates workflow speed by reducing research time from hours to seconds. It improves compliance behavior by making it easy to identify how similar situations were handled and whether those approaches withstood review. And it influences decision-making by providing contracting officers with broader context than any individual could retain, enabling more informed judgments about risk, approach, and documentation strategy. Equally important, portfolio-level visibility through the Insights dashboard enables leadership to make resource allocation decisions based on actual data rather than estimates. When leaders can see workload distribution, obligation rates, and risk concentration in real time, they can proactively address bottlenecks and prevent delays before they impact mission readiness.

Conclusion

This research demonstrates that the fastest path to accelerating defense acquisition is not replacing human judgment but amplifying it. Human-centered AI designed to augment contracting officers rather than automate their work addresses the regulatory, audit, and accountability concerns that automation-first approaches create while delivering measurable improvements in speed, quality, and confidence.

The Eudia Unified Platform, validated through operational deployment at the 39th Contracting Squadron and informed by discovery across the acquisition enterprise, provides a model for how AI can be structured to support rather than supplant professional expertise. By keeping humans in control of every decision while providing them with capabilities that exceed what any individual could accomplish alone, this approach aligns with both the statutory structure of federal acquisition and the practical needs of an overworked workforce.

The implications extend beyond any single contracting squadron. The challenges identified in this research—regulatory complexity, disconnected systems, data-rich but insight-poor environments, and misaligned expectations between requirement owners and contracting officers—exist across the Department of War acquisition enterprise. Solutions proven at the squadron level have potential to scale, delivering PALT reductions that translate directly into faster delivery of warfighting capability.

Acknowledgments

This research would not have been possible without the exceptional collaboration of acquisition professionals across the Department of War who generously contributed their time, expertise, and candid perspectives. We are deeply grateful to the men and women of the 39th Contracting Squadron at Incirlik Air Base, whose willingness to test operational prototypes and provide continuous feedback shaped every aspect of the Eudia Unified Platform. We extend particular thanks to Captain Cameron Cochran and Sergeant William Rife, whose partnership was instrumental to the success of this engagement.

We also acknowledge the invaluable contributions of stakeholders at Space Systems Command, the Office of the Chief of Space Force Contracting, the Air Force Test Center, and Headquarters Air Force Materiel Command. Their willingness to engage in guided discussions about workflow challenges, capability gaps, and opportunities for innovation provided essential context that strengthened this research.

We are fortunate to have had so many acquisition professionals at every level from flight to headquarters willing to share their experiences and perspectives for the purpose of advancing this work. Their commitment to improving defense acquisition, even amid demanding operational responsibilities, reflects the professionalism and dedication that characterizes the acquisition workforce. This research is ultimately in service of their mission: delivering warfighting capability to those who defend the nation.


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