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U.S. Army Prototype and Production Other Transaction Trends and Potential Fiscal Year 2023 National Defense Authorization Act Effects

June 2024

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

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ABSTRACT

Amid an evolving defense landscape and the U.S. Army's Army 2030 strategic directive, the Department of Defense (DOD) has accelerated its embrace of Other Transactions (OTs), with the Army at the forefront. Utilizing the System for Award Management (SAM) database, this study analyzes the Army's prototype and production OT usage from Fiscal Year (FY) 2021 to FY2023, identifying key trends and major contractors. Notably, a gap has been observed in analyzing the Army's OT engagements post-FY2020, which this study seeks to bridge. The FY2023 National Defense Authorization Act (NDAA) amendments to 10 U.S.C. \$4022, an evolution of the previously designated 10 U.S.C. \$2371b, is central to this investigation, which eliminates the previously mandated re-competition of prototype OTs as they transition to follow-on production OTs. This pivotal policy change stands to recalibrate the competitive dynamics surrounding prototype OTs, influencing the Army's choice of partners and collaboration mechanisms. The analysis reveals a significant increase in production OTs, underscoring a strategic shift towards accelerating the fielding of innovations. A diversified vendor base is evident, reflecting an embrace of non-traditional partners. This study aligns OT trends with NDAA's influence, highlighting a streamlined procurement strategy that anticipates agile technological advancements under Army 2030 objectives.



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LIST OF ACRONYMS AND ABBREVIATIONS

ACC	Army Contracting Command
APG	Aberdeen Proving Ground
CSIS	Center for Strategic and International Studies
DIUx	Defense Innovation Unit (Experimental)
DOD	Department of Defense
FAR	Federal Acquisition Regulation
FPDS	Federal Procurement Data System
FY	Fiscal Year
GAO	Government Accountability Office
IT	Information Technology
IVAS	Integrated Visual Augmentation System
LRIP	Low-Rate Initial Production
NDAA	National Defense Authorization Act
NGSW	Next Generation Squad Weapon
NTC	Non-Traditional Defense Contractor
ОТ	Other Transaction
R&D	Research and Development
RVTC	Reconfigurable Virtual Collective Trainer
SAM	System for Award Management
SBIR	Small Business Innovation Research
U.S.C.	United States Code



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EXECUTIVE SUMMARY

This thesis investigates the Army's evolving utilization of Other Transactions (OTs) for prototyping and production from FY2021 to FY2023, emphasizing the strategic shifts induced by the FY2023 NDAA amendments. The Army's engagement in OTs, especially in the backdrop of legislative changes and strategic objectives outlined in Army 2030, provides a critical lens to analyze procurement strategies to maintain technological superiority and respond agilely to emerging threats.

The research identifies significant shifts in OT obligations, highlighting a strategic pivot from a predominant focus on prototyping toward an increased emphasis on production OTs. This shift symbolizes a broader strategic realignment towards accelerating the transition from prototype development to full-scale production, enhancing the Army's capability to deploy new technologies swiftly. The analysis reveals that from FY2021 to FY2023, despite fluctuations due to external factors like the COVID-19 pandemic, the Army demonstrated resilience and adaptability in its OT utilization patterns, reflecting an overarching commitment to innovation and technological advancement.

A detailed examination of the Army's OT engagements uncovers a diversified portfolio of vendors, ranging from consortia and non-traditional defense contractors to industry giants, underscoring a multifaceted approach to fostering innovation and securing cutting-edge technologies. This vendor diversity and the strategic adjustments in OT obligations align with the Army 2030 vision's emphasis on modernization, readiness, and operational effectiveness.

The thesis also explores the ramifications of the FY2023 NDAA amendments on the Army's procurement dynamics. By removing specific competition requirements for transitioning prototype OTs to production OTs, the legislative changes introduce a newfound flexibility in procurement processes. This legislative evolution, when viewed through the lens of the Army's strategic goals and the observed trends in OT utilization, suggests a proactive and strategic adaptation to the changing landscape of defense procurement.



In conclusion, the thesis outlines a comprehensive analysis of the Army's use of OTs from FY2021 to FY2023, articulating the nuanced shifts in procurement strategies and vendor engagement patterns. The findings underscore a deliberate progression toward leveraging OTs as a mechanism for rapid prototyping and expediting the transition to full-scale production, a pivotal component of the Army's broader strategy to maintain a competitive edge through technological innovation and agility. The research sheds light on the current state of Army procurement, offering insights into potential trajectories of defense acquisition strategies at the intersection of legislative reforms, strategic objectives, and operational imperatives.



I. INTRODUCTION

The Department of Defense (DOD) has significantly shifted its procurement strategies in recent years, increasingly leveraging Other Transactions (OTs) to expedite innovation and technological advancement (McCormick & Sanders, 2022, p. 6). At the vanguard of this transition, the Army has actively utilized OTs, particularly for prototype and production purposes (McCormick & Sanders, 2022, p. 12). This method has proven effective in rapidly addressing modern warfare's evolving threats and technological challenges. However, a detailed examination of the Army's OT utilization patterns remains notably absent post Fiscal Year (FY) 2020, despite the escalating reliance on these agreements. This analytical gap has become more pronounced with the enactment of the FY2023 National Defense Authorization Act (NDAA). The FY2023 NDAA introduces substantial reforms to 10 U.S.C. §4022, formerly 10 U.S.C. §2371b, most notably removing the requirement for re-competition when transitioning prototype OTs to production OTs (James M. Inhofe National Defense Authorization Act [NDAA] for Fiscal Year 2023, 2022). This legislative change is expected to have far-reaching implications on the competitive dynamics of defense procurement, influencing how and with whom the Army collaborates for its prototyping and production needs and potentially setting a new standard practice in transitioning from prototype development to Low-Rate Initial Production (LRIP) (Bell, 2023, p. 4).

Removing the non-competition requirement represents a strategic shift towards efficiency and agility in defense procurement. It allows for a more seamless and expedited transition from prototype development to production phases, reducing bureaucratic hurdles and fostering a more responsive acquisition environment. These changes align with the Army's "Army 2030" strategic goals and broader DOD objectives to maintain technological superiority in an increasingly complex global security environment (U.S. Army, 2022, p. 1). The streamlined process could enhance the Army's ability to rapidly deploy new technologies and capabilities, a critical factor in staying ahead of potential adversaries. However, understanding the implications of these legislative changes and their alignment with the Army's strategic objectives requires a comprehensive analysis of recent



ACQUISITION RESEARCH PROGRAM Department of Defense Management Naval Postgraduate School OT trends. Such insights are essential for optimizing current procurement strategies and shaping future policy directions, ensuring the Army remains agile and responsive to emerging threats and opportunities in a rapidly evolving landscape (DOD, 2022, p. 4).

A. PROBLEM STATEMENT

The central issue is the absence of a thorough analysis of the Army's employment of OTs for prototype and production purposes post-FY2020. This information gap becomes increasingly critical considering the substantial modification introduced in the FY2023 NDAA, specifically in 10 U.S.C. §4022. The FY2023 NDAA has broadened the scope and application of production OTs, which has significant implications for the Army's acquisition processes (Bell, 2023, p. 4). However, without detailed insights into how OTs have been utilized since FY2020, it becomes challenging to gauge the potential effects of legislative change and to make informed decisions about future acquisition strategies.

The lack of updated data and analysis hinders the Army's ability to comprehensively understand the adaptation and optimization of its use of OTs and its alignment with the evolving directives of Army 2030. The Army's increased reliance on OTs from FY2015 to FY2020 demonstrated a strategic shift toward more agile and innovative procurement methods, responding to the need for rapid development and deployment of new technologies and capabilities. However, to fully leverage the expanded opportunities provided by the FY2023 NDAA, it is imperative to understand the trends and challenges encountered in the recent past. This understanding is crucial for identifying best practices, potential pitfalls, and areas requiring further improvement or adjustment. This absence of detailed analysis makes it challenging to formulate effective and efficient acquisition strategies for the future.

B. PURPOSE STATEMENT

This research aims to analyze and understand the evolution of the Army's utilization of OTs for prototype and production between FY2021 and FY2023. This research scrutinizes the changing trends in OT usage, identifies the key entities and contractors engaged by the Army for these purposes, and dissects the distribution and nature of these contracts in terms of type, value, and competition. By closely examining



these elements, the study offers a comprehensive view of the Army's prototype and production OT activities during this period. Furthermore, building upon this analysis, the thesis explores the potential implications of the amendments introduced in the FY2023 NDAA on future prototype and production OT usage patterns within the Army. This research provides valuable insights into the Army's evolving acquisition strategies, contributing to understanding how legislative changes may impact the Army's pursuit of modernization and technological advancement in line with its strategic objectives.

C. RESEARCH QUESTIONS

This capstone project addresses pivotal research questions that serve as the inquiry's backbone.

- Q1: How have the Army's prototype and production OT usage trends evolved between FY2021 and FY2023?
- Q2: Which entities or contractors did the Army predominantly engage with to procure prototype and production OTs between FY2021 and FY 2023?
- Q3: How have the Army's production competition trends evolved between FY2021 and FY2023?
- Q4: Based on the analysis of trends between FY2021 and FY2023, what potential implications could the amendments in the FY2023 NDAA introduce to the Army's future prototype and production OT usage patterns?

Central to this exploration is the primary research question, which is intent on unraveling the evolutionary patterns of the Army's use of OT for prototype and production between FY2021 and FY2023. This fundamental query is bolstered by secondary questions that dig deeper into the operational specifics. The research identifies the primary entities or contractors with whom the Army has engaged for procuring prototype and production OTs during this period and analyzes the distribution and characteristics of these



transactions. Furthermore, the tertiary question builds upon the insights garnered, seeking to project the potential impacts of the FY2023 NDAA amendments on the Army's future OT usage patterns. With each question designed to unfold different facets of the Army's procurement strategy, this multi-layered approach culminates in a comprehensive understanding of the current state and future trajectory of the Army's OT engagements in the context of evolving legislative and operational landscapes.

D. METHODOLOGY

To effectively explore the Army's use of OTs for prototype and production from FY2021 to FY2023, this study adopts a mixed-methods approach, combining quantitative and qualitative research methodologies. The quantitative component systematically analyzes data from the SAM.gov databases, specifically targeting numerical information such as contractor identities, contract values, contract types, and contract dates. This analysis aims to uncover the frequency, nature, and size of awarded prototype and production OTs, identifying the key entities or contractors involved and competition patterns. Complementing this analysis, the qualitative aspect of the study investigates deeper into the context and implications of the FY2023 NDAA amendments on future OT usage patterns. The study culminates in an integrated analysis, wherein findings from quantitative data and qualitative insights are synthesized. This cohesive approach provides a robust empirical foundation and adds depth and context, offering a comprehensive presentation of the Army's evolving procurement strategy in response to legislative and operational changes.

E. SCOPE

This research is limited to the trends and entities involved in the Army's use of OTs for prototype and production from FY2021 to FY2023 and the potential implications of the FY2023 NDAA competition amendment. The primary focus lies in analyzing the patterns and shifts in the Army's OT engagements, identifying the key entities with which the Army has contracted, and evaluating the impact of the FY2023 NDAA amendment on these trends. This analysis describes the current trends and attempts to forecast future OT usage patterns within the specified timeframe.



However, the study has certain limitations. First, there is a potential lag in data updates and the possibility of omitted contracts for security purposes within the SAM.gov databases, which may affect the completeness of the data. Furthermore, the scope is restricted to FY2021 through FY2023, and any conclusions drawn are bound to this timeframe. Forecasting future OT usage patterns is inherently uncertain, especially considering the dynamic nature of military procurement and policy changes. Additionally, while the study focuses on the implications of the FY2023 NDAA, external factors beyond this legislative framework could influence the Army's OT strategies. Despite these limitations, the research aims to comprehensively present the Army's OT engagements during this critical period, offering insights into its procurement strategy and suggestions for future direction.

F. ORGANIZATION OF STUDY

Chapter II provides background on OTs, protests, the historical and current significance of the NDAA, and the dynamics of OTs within the context of the NDAA and the Army 2030 initiative. The literature selected encompasses a range of sources pertinent to defense procurement, policy analysis, and military strategy. Chapter III conducts a detailed literature review of the Rhys McCormick and Gregory Sanders study, which examines trends in Army OT usage between FY2015 and FY2020. The findings of that study serve as the foundation for this thesis, which extends the analysis of these trends beyond FY2020. Chapter IV outlines the methodology employed in this study. It describes the data collection processes and the analytical methods used to identify the problem and answer the research questions. Chapter V presents the results derived from the methodology outlined in Chapter IV. It connects qualitative and quantitative analysis, answering a cohesive narrative that illustrates the role and evolution of OTs within the Army procurement strategies. Chapter VI concludes the study by summarizing the main findings, answering the research questions, and providing conclusions and recommendations for further research.



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II. BACKGROUND

The Army's adoption and utilization of OTs is a multifaceted area of study, rich in its historical context and implications for the future of military procurement and innovation. This research focuses on four key aspects that collectively provide a comprehensive understanding of OTs within the Army: the nature and scope of OTs themselves, the legislative framework provided by the NDAA, protests and their implications, and the strategic vision underpinning the Army 2030 initiative.

Each component plays a crucial role in shaping how the Army employs OTs. The concept of OTs offers a unique contractual pathway, diverging from traditional procurement methods to foster innovation and agility. The NDAA provides the legal and policy framework that governs the use of OTs, reflecting evolving legislative priorities and defense needs. The historical trends in OTs from 2015 to 2020 reveal how the Army has leveraged these transactions to meet its changing technological and strategic requirements. Finally, the Army 2030 initiative gives context to the future direction of the Army's use of OTs, aligning them with broader goals of modernization and adaptation to new forms of warfare.

Though these components serve the same fundamental purpose of enhancing the Army's procurement and development capabilities, each offers distinct insights into how OTs are tailored to meet the Army's specific needs, reflecting the unique challenges and opportunities presented by different technological and strategic landscapes.

A. OTHER TRANSACTIONS

OTs are specialized instruments the DOD uses for flexibility and adaptability in acquiring cutting-edge technology. They are particularly significant because they enable the DOD "to adopt and incorporate business practices aligned with commercial industry standards and best practices" (Office of the Under Secretary of Defense for Acquisition and Sustainment [OUSD(A&S)], 2023, p. 4). This adaptability is crucial for accessing "state-of-the-art technology solutions from both traditional and non-traditional defense contractors (NDCs)" (OUSD[A&S], 2023, p. 4). NDCs are often entities that may not



ACQUISITION RESEARCH PROGRAM Department of Defense Management Naval Postgraduate School typically engage in Federal Acquisition Regulation (FAR)-based contracts with the government; thus, OTs open doors for new collaborations and approaches (OUSD[A&S], 2023, p. 4).

1. Other Transaction Purpose

The purpose of OTs is multifaceted. First, they foster new relationships and practices between the government, traditional contractors, and NDCs, broadening the government's industrial base (OUSD[A&S], 202, p. 4). This is particularly important for projects that may not appeal to contractors under normal FAR-based contracts. Second, they support dual-use projects with civilian and military applications, thereby maximizing the utility and applicability of developed technologies (OUSD[A&S], 2023, p. 4). Third, OTs encourage quicker, more flexible, and cost-effective project design and execution than traditional government contracting methods (OUSD[A&S], 2023, p. 5). This flexibility is essential in rapidly evolving technological fields. Fourth, they leverage commercial industry investment in technology development, ensuring that the DOD's requirements are considered in the evolution of future technologies and products (OUSD[A&S], 2023, p. 5). Lastly, OTs facilitate collaboration in innovative arrangements, allowing for creative and efficient solutions to complex defense needs (OUSD[A&S], 2023, p. 5).

2. Types of Other Transactions

OTs used by the DOD are categorized into three primary types: research, prototype, and production OTs, each tailored to fulfill specific roles in the acquisition and development process. This research focuses solely on production and prototype OTs.

Prototype OTs, under the authorization of 10 U.S.C. §4022, focus on developing prototype capabilities with the potential to transition into production (OUSD[A&S], 2023, p. 36). They support a broad range of projects, including both dual-use and defense-specific applications. Within 10 U.S.C. §2371(b), a prototype project in the context of OTs is defined as

a project that addresses a proof of concept, model, reverse engineering to address obsolescence, pilot, novel application of commercial technologies for defense purposes, agile development activity, creation, design,



development, demonstration of technical or operational utility, or combinations of the foregoing. A process, including a business process, may be the subject of a prototype project. (Authority of the Department of Defense to Carry Out Certain Prototype Projects, 1956, p. 2911)

A key aspect of prototype OTs is their streamlined pathway for transitioning successful prototypes directly into production, bypassing further competition (OUSD[A&S], 2023).

Production OTs are the follow-on phase, as authorized by 10 U.S.C. §4022(f), for prototype OTs that were competitively awarded and successfully completed.

A transaction for a prototype project is complete upon the written determination of the appropriate approving official for the matter in question that efforts conducted under a Prototype OT: (1) met the key technical goals of a project; (2) satisfied success metrics incorporated into the Prototype OT; or (3) accomplished a particularly favorable or unexpected result that justifies the transition to production. Furthermore, successful completion can occur prior to the conclusion of a prototype project to allow the Government to transition any aspect of the prototype project determined to provide utility into production while other aspects of the prototype project have yet to be completed. (Authority of the Department of Defense to Carry Out Certain Prototype Projects, 1956, p. 2911)

Production OTs represent the transition from a successful prototype to full-scale production (OUSD[A&S], 2023, p. 7). This type of OT facilitates a seamless move from prototype development into production, streamlining the DOD's acquisition process (OUSD[A&S], 2023, p. 7). Until the FY2023 NDAA, government organizations, including the DOD, were required to provide explicit notification of a non-competed follow-on production possibility in the prototype solicitation.

3. Consortiums

Consortiums have become critical for facilitating OTs between government entities and organizations, including for-profit companies, nonprofits, and universities. These formalized groups are centered around specific subject areas such as land systems, medical technology, explosives and ammunition, computers and cybersecurity, and aviation, aiming to streamline working with the government (Soloway et al., 2021, p. 33). Membership is open to any interested firm, with an annual fee that varies from a few



hundred to thousands of dollars, though it is often waived for academic institutions (Soloway et al., 2021, p. 34). This fee supports the operational costs of the consortium management group, which, in turn, allows members to vie for government awards for research, development, and production.

The rise in consortiums' popularity is largely attributed to their role in simplifying access to OTs for government organizations, reducing the need for extensive in-house expertise (Soloway et al., 2021, p. 33). They are the main avenue for OT awards, with a significant portion of OT funding channeled through them. The formation of a consortium begins with a bidding and selection process initiated by an organization with OT authority, focusing on a specific need area (Soloway et al., 2021, p. 34).

Consortiums offer numerous benefits, such as fostering a collaborative approach to contract requirements, enhancing the speed of research and prototype acquisition, and expanding the government's technology and industrial base by incorporating nontraditional contractors (Soloway et al., 2021, p. 34). They also provide invaluable insights and guidance for universities and research institutions.

However, the increasing reliance on consortiums has raised several concerns. There is a notable lack of transparency regarding the allocation of funds within consortiums, and the fee structures may pose barriers to entry for smaller, emerging companies (Soloway et al., 2021, p. 35). Furthermore, the potential for overlap among consortiums raises questions about market efficiency and the diversity of the technological and industrial base accessed through OTs (Soloway et al., 2021, p. 35).

B. NATIONAL DEFENSE AUTHORIZATION ACT

The NDAA is a pivotal piece of legislation passed annually by Congress to outline the budget, expenditures, and policy directives for the DOD. It is a comprehensive framework for national defense priorities, allocating resources for military operations, personnel, and equipment. Over the years, it has played a pivotal role in shaping the scope and application of OTs within the DOD. Each iteration of the NDAA has introduced changes that have incrementally expanded or refined the parameters under which OTs operate since their origination in 1958.



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1. Historical NDAA Changes and OT Implications

This section presents a discussion of the evolution of OT authority, as outlined in Figure 1, tracing its expansion from an exclusive tool of the Defense Advanced Research Projects Agency (DARPA) to a fundamental component of the DOD's acquisition strategy. In 1996, the FY1994 NDAA (Section 804) expanded OT jurisdiction to others in the DOD outside of DARPA, and by the FY2002 NDAA (Section 822), OT jurisdiction included prototypes and follow-on production. By 2012, the FY2013 NDAA (Section 863) extended the authority for OTs for an additional five years, ensuring their continued use in defense procurement and research (OUSD[A&S], 2023, p. 39). The FY2015 NDAA further broadened the scope of OTs. Section 812 exempted small businesses from the cost-sharing requirement, encouraging greater participation from smaller entities in defense innovation (OUSD[A&S], 2023, p. 39).

One of the most significant changes came with the FY2016 NDAA (Section 815), which permanently codified OTs in 10 U.S.C. §2371b. This act rescinded the authority under Section 845 and redefined and codified NDCs in 10 U.S.C. §2302(9), expanding the follow-on production (OUSD[A&S], 2023, p. 40). These changes marked a crucial shift, firmly establishing OTs as a mainstay in defense contracting and expanding their reach to a broader array of contractors, including those who might not have previously engaged with the DOD due to the complexities of traditional defense contracts.

The FY2018 NDAA (Sections 863–864) continued this trend by adding educational and training requirements, increasing approval thresholds, and clarifying approval levels for OTs (OUSD[A&S], 2023, p. 40). It also explicitly authorized the award of prototype OTs in the Small Business Innovation Research (SBIR) program, further integrating OTs into the broader framework of defense research and development initiatives (OUSD[A&S], 2023, p. 40).

Through these iterations of the NDAA, OTs have evolved from a niche instrument into a cornerstone of the DOD's acquisition strategy, offering flexibility, fostering innovation, and expanding the defense industrial base.



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Year	Congressional Authorization
1958	OT authorization originates with NASA
1989	OT authorization extends to DARPA
1993	FY 94 NDAA : Sec. 845 expands DARPA authorization to include prototyping
1996	FY 97 NDAA : Sec. 804 expands OT jurisdiction to others in the DoD
2001	FY 02 NDAA : Sec. 822 permits OTs for follow-on production
2012	FY13 NDAA : Sec. 863 extends the authority for an additional five years
2014	FY 15 NDAA : Sec. 812 exempts small businesses from the cost-sharing requirement
2015	FY 16 NDAA : Sec. 815 makes DoD OT jurisdiction permanent, codified in 10 U.S.C. §2371b, modifies the definition of non-traditional contractor, allows DoD to issue follow-on production for OT prototypes
2017	FY 18 NDAA : Sec. 863-864 adds education and training requirements, increases approval thresholds, grants authority to award OTs in the SBIR program and non-profit research institutions
2021	FY 22 NDAA : Sec. 1841 transfers sections 2371 and 2371b to 10, U.S.C. 4002 and 4003
2022	FY 23 NDAA : Sec. 842-843 amends 10 U.S.C §4022(f)(2) and (f)(4): 10 U.S.C. §4022(f)(2) – authorizes follow-on production OTs if requirements are met, even if explicit notification was not listed 10 U.S.C. §4022(f)(4) - authorizes movement from prototype to follow-on production without successful completion of all activities

Figure 1. History of DOD OT Authority. Adapted from Office of the Under Secretary of Defense for Acquisition and Sustainment (2023).

2. FY2023 NDAA Key Updates

The FY2023 NDAA introduces critical amendments significantly influencing the DOD's procurement strategies, particularly transitioning from prototype development to follow-on production. This research centers on the pivotal legislative updates embedded



within 10 U.S.C. §4022, a progression from the earlier 10 U.S.C. §2371b, highlighting how these changes streamline the awarding process for follow-on production contracts or transactions. Key among these changes are the provisions in 10 U.S.C. §4022(f)(2) and 10 U.S.C. §4022(f)(4).

The initial amendment of significance in the FY2023 NDAA is a pivotal element of this thesis. With the introduction of new language into 10 U.S.C. §4022, an evolution of the previously designated 10 U.S.C. §2371b, the NDAA has significantly altered the landscape for awarding follow-on production contracts or transactions. 10 U.S.C. \$4022(f)(2) states

A follow-on production contract or transaction provided for in a transaction under paragraph (1) may be awarded to the participants in the transaction without the use of competitive procedures, notwithstanding the requirements of chapter 221 of this title and **even if explicit notification was not listed within the request for proposal for the transaction** if- (A) competitive procedures were used for the selection of parties for participation in the transaction; and (B) the participants in the transaction successfully completed the prototype project provided for in the transaction. (Authority of the Department of Defense to Carry Out Certain Prototype Projects, (1956, p. 2911)

This represents a legal shift that overrides prior requirements for explicit notification for sole-source follow-on production work, as previously scrutinized in bid protest decisions by the Government Accountability Office (GAO), such as Oracle America, Inc. v. the U.S. Army (Summer & Davis, 2018, p. 1).

Additionally, the FY2023 NDAA provides clearer guidance on determining "successful completion" for prototype OTs, facilitating a smoother transition from prototype development to follow-on production. 10 U.S.C. §4022(f)(4) states

Award of a follow-on production contract or transaction pursuant to the terms under this subsection is not contingent upon the successful completion of all activities within a consortium as a condition for an award for follow-on production of a successfully completed prototype or prototype subproject within that consortium. (Authority of the Department of Defense to Carry Out Certain Prototype Projects, (1956, p. 2912)



These amendments further expand the DOD's authority and flexibility in issuing follow-on production contracts, building on the momentum established by the FY2016 NDAA. This progression underscores a strategic commitment to streamline the process from prototyping to production, thereby accelerating the acquisition of critical technologies and capabilities. These measures further insulate the DOD from potential protests, providing a more robust framework that mitigates delays and challenges in the procurement cycle. The intent is clear: to enhance the DOD's ability to foster innovation and swiftly integrate emerging technologies into its operational framework, ensuring a more agile and responsive defense capability. This continued evolution in policy reflects a deliberate effort to optimize the defense acquisition process, aligning it more closely with the rapid pace of technological advancement and the critical need for national security enhancements.

C. PROTESTS

A protest, as defined by the FAR, is "a written objection by an interested party to a solicitation, the cancellation of a solicitation, an award or proposed award of a contract, and a termination or cancellation of an award of the contract" (FAR 33.101, 2024). Protests provide a formal mechanism for contractors and offerors to challenge decisions related to the awarding of government contracts. As the largest single procurer of goods and services, the government engages in a complex acquisition process governed by specific statutes, regulations, and socioeconomic policies (Defense Acquisition University [DAU], 2024, p. 1). FAR 33.1 and Title 4 of the Code of Federal Regulations (C.F.R.), Section 21, delineate the policies and procedures for lodging protests.

Protests can be filed with either the awarding government agency, the GAO, or the Court of Federal Claims, depending on the nature of the grievance. Agency protests are encouraged to be resolved through open and frank discussions, aiming for an informal and expeditious resolution (DAU, 2024, p. 1). The GAO offers an objective and impartial forum for dispute resolution, typically providing faster outcomes than court litigation. At the same time, the Court of Federal Claims often involves higher costs and is generally reserved for pre-award bid protests (DAU, 2024, p. 1).



Protest decisions are crucial in shaping the DOD procurement processes and policies, intertwining impacts on project timelines, operational readiness, and the competitive environment among defense contractors. These decisions unveil flaws that need improvement—prompting revisions to the DOD's policies, procedures, and practices—and significantly influence the procurement landscape. By highlighting these vulnerabilities, protests catalyze broader changes, potentially encouraging more defense contractors to challenge DOD procurement decisions. A heightened propensity to protest can, in turn, lead to further delays in contract awards.

1. Oracle America, Inc. v. the U.S. Army

The GAO's decision to uphold Oracle America, Inc.'s protest of the Army's decision to award a \$65 million cloud migration deal to REAN Cloud, LLC demonstrates the implications of protests on the DOD's use of OTs. The backdrop of this protest was set against the Defense Innovation Unit (Experimental; DIUx) initiative to expedite the development and integration of commercially derived technologies into the military (Summer & Davis, 2018, p. 1). This was undertaken via the statutory framework of 10 U.S.C. §2371b, now known as 10 U.S.C. §4022, which allows companies awarded initial Other Transaction Authority (OTA) prototyping work to be awarded a follow-on production OT deal, under certain conditions (Summer & Davis, 2018, p. 1). Following a competitive solicitation process, DIUx selected REAN Cloud for a prototype OT in March 2017. After multiple modifications, DIUx awarded REAN Cloud a follow-on production OT in February 2018. Oracle's challenge centered on the claim that the Army's award did not comply with specific statutory requirements for OTs, particularly that the prototype OT must explicitly provide for a follow-on production OT and that the prototype project must be completed before a production OT award (Summer & Davis, 2018, p. 2).

The GAO sustained Oracle America, Inc.'s protest, concluding the Army had no authority to award a production OT in this case (GAO, 2018, p. 19). The GAO recommended that the Army cancel the production OT and reassess its procurement strategy. The GAO also provided three recommendations should the Army still require cloud migration services.



The Army should either "conduct a new procurement using competitive procedures, in accordance with the statutory and regulatory requirements, prepare the appropriate justification required by CICA to award a contract without competition or review its other transaction authority to determine whether an award is possible thereunder" (GAO, 2018, p. 19).

The GAO's decision to sustain Oracle's protest against the Army under 10 U.S.C. §2371b, now known as 10 U.S.C. §4022, carries significant negative implications. The GAO's strict interpretation of the statutory language, particularly the requirement that a prototype OT must explicitly reserve the option for a follow-on production contract to utilize noncompetitive follow-on production authority, creates two limitations (Section 809 Panel, 2019, p. 444).

First, the strict interpretation of the statutory language of 10 U.S.C. §2371b (10 U.S.C. §4022) leaves existing OTs without the possibility of transitioning to a follow-on production transaction, undermining the flexibility and speed OTs were designed to offer (Section 809 Panel, 2019, p. 444). This is particularly problematic even when the initial OT solicitation indicated the potential for a sole-source follow-on award, as the GAO found this notification insufficient unless explicitly included in the prototype OT agreement itself (Section 809 Panel, 2019, p. 445). This requirement for strict compliance, as emphasized by the GAO, does not necessarily enhance transparency or competition (Section 809 Panel, 2019, p. 445).

Second, the GAO's decision places itself as the ultimate judge of whether a prototype project has been "successfully completed," a determination that traditionally resides with the requiring activity within the DOD (Section 809 Panel, 2019, p. 445). This shift could limit the DOD's ability to rapidly proceed to production based on successful prototype outcomes, especially if additional work required by modifications to the original OT has not been completed (Section 809 Panel, 2019, p. 445). This interpretation incentivizes agencies to alter transaction agreements before awarding follow-on transactions to bypass incomplete requirements. This strategy could be viewed as lacking transparency and fairness, potentially undermining the "regulatory free space" that OTs operate within (Section 809 Panel, 2019, p. 445).



Protest decisions, especially those challenging DOD procurement strategies, can have profound implications, as illustrated by the GAO's decision in the case of Oracle America, Inc. vs. the U.S. Army. This decision underscores the intricate balance between fostering innovation through flexible procurement mechanisms and adhering to statutory requirements. The GAO's stringent interpretation of the need for explicit provisions for follow-on production OTs and the completion of prototype projects before awarding production OTs has introduced significant constraints. These constraints limit the DOD's agility in leveraging OTs to rapidly transition cutting-edge technologies from prototype to production and impose a more rigid framework that could stifle innovation and responsiveness within the defense procurement ecosystem. To avoid these constraints on the DOD, it is imperative to preserve and insulate the flexibility of OTs, particularly for follow-on production opportunities. This can be achieved by implementing policy measures to prevent protests from narrowing the scope of their use, as seen in the updates to the FY2023 NDAA.

D. ARMY 2030

Published in 2022, Army 2030 lays out a transformative blueprint for reshaping the Army to confront the pacing threats of strategic adversaries and to secure a technological edge in an evolving battlefield landscape. The strategy underscores a pivot to modernization, prioritizing integrating cutting-edge technologies such as advanced sensors, unmanned and autonomous systems, and robust cyber defense mechanisms (U.S. Army, 2022, p. 1). It anticipates the convergence of effects across domains—land, air, sea, space, and cyberspace—and recognizes the necessity of rapid innovation and accelerated procurement cycles to achieve these goals.

The strategic vision of Army 2030 is reflected in the Army's growing reliance on OTs for prototyping and production. OTs represent a departure from traditional procurement methods, offering a more flexible and dynamic approach well-suited to the rapid development and deployment of advanced technologies and systems. This methodological shift is in harmony with the Army 2030 imperative for swiftly fielding next-generation capabilities and fostering a culture of continuous innovation.



ACQUISITION RESEARCH PROGRAM Department of Defense Management Naval Postgraduate School

E. BACKGROUND SUMMARY

The background chapter analyzed key elements vital to understanding the Army's use of OTs for military procurement and innovation. OTs were explored as flexible instruments diverging from traditional procurement, enhancing innovation and agility. The NDAA was examined for its critical role in shaping OT usage, reflecting the evolving defense landscape. The unique contributions of the OT concept, the dynamic NDAA framework, and the forward-looking Army 2030 vision in shaping the Army's use of OTs were emphasized. The adaptability of OTs in fostering new industry relationships and supporting dual-use projects, alongside the NDAA's evolving scope, demonstrates a legislative commitment to adaptability. Concurrently, the Army 2030 vision aligns OTs with future modernization and technology goals. These facets provide a comprehensive understanding of how OTs are tailored to meet the Army's evolving needs in diverse technological and strategic contexts. This chapter lays the groundwork for subsequent indepth analysis of OT usage trends and the implications of the FY2023 NDAA.


III. LITERATURE REVIEW

This chapter is devoted to examining research that sheds light on the dynamic landscape of DOD procurement practices, focusing on OT usage from FY2015 to FY2020 and the broader defense acquisition trends up to FY2023. This exploration begins with an in-depth analysis conducted by Rhys McCormick and Gregory Sanders for the Center for Strategic and International Studies (CSIS), which documents a significant transformation in the DOD's procurement strategies through the lens of OT spending. This study is instrumental in establishing a historical context, revealing a marked shift toward embracing OTs, especially by the Army, and setting a precedent for understanding the evolution of defense procurement processes.

Furthermore, the research investigates the Defense Acquisition Trends of FY2023, as outlined by Gregory Sanders, Nicholas Velazquez, Emily Hardesty, and Audrey Aldisert. Their report provides a contemporary overview of the acquisition landscape, acknowledging the impact of global disruptions such as the ongoing war in Ukraine, tensions in the Indo-Pacific, and emerging conflicts in the Middle East on the DOD's strategic priorities and acquisition practices. This analysis is crucial for understanding how recent external challenges have influenced the DOD's adaptation and strategic foresight in procurement activities.

Last, the FY2023 Bloomberg Government Contracting Playbook analyzes future contracting opportunities across six key markets, offering insights into the evolving landscape shaped by technological advancements and operational needs. This forward-looking perspective serves as an additional layer of context, enabling a comprehensive understanding of DOD initiatives and the strategic alignment of future acquisition strategies to meet emerging threats and opportunities.

A. CENTER FOR STRATEGIC AND INTERNATIONAL STUDIES RESEARCH: TRENDS IN DOD OT SPENDING

Rhys McCormick and Gregory Sanders conducted a study for the CSIS to examine the DOD's trends in OT usage from FY2015 to FY2020. Their research highlighted a



notable transformation in procurement practices, with the Army leading the way in embracing OTs. Figure 2 demonstrates the substantial increase in OT obligations, especially in the later years, with the Army's usage of OTs growing by 161%. This growth positioned the Army as the foremost user of OTs among all DOD components (McCormick & Sanders, 2022, p. 20).



Figure 2. Defense OT Obligations by Customer. Source: McCormick & Sanders (2022).

In their study, McCormick and Sanders analyzed trends in OT obligations, mainly focusing on the type of agreements within the Army. They observed a dramatic increase in Army production OT obligations in FY2020, which skyrocketed by 1,594%, escalating from \$0.01 billion to \$0.23 billion, as shown in Figure 3 (McCormick & Sanders, 2022, p. 23). Despite this significant rise, it pales compared to the \$12.99 billion allocated for prototyping. The limited data available on this subject at the time of their study was attributed to the recency of the DOD's follow-on prototyping authority established by the FY2016 NDAA. McCormick and Sanders emphasized the importance of monitoring these developments in the coming years "as critical pillars of the Army's modernization strategy



start to move from prototypes to production" (McCormick & Sanders, 2022, p. 23). This need for continued observation forms the basis of this study, addressing a crucial gap in current research.



Figure 3. Army OT Obligations by Type of Agreement. Source: McCormick & Sanders (2022).

The McCormick study highlighted a significant shift in Army OT obligations by platform portfolio. As seen in Figure 4, traditionally, ordnance and missiles dominated OT spending, but their market share declined, dropping from 56% in FY2019 to 19% in FY2020 (McCormick & Sanders, 2022, p. 24). In contrast, other products and other knowledge-based obligations surged, mainly due to the COVID-19 response, increasing by 523% from FY2019 to FY2020. This portfolio experienced a remarkable 7,322% growth from FY2015 to FY2020. Meanwhile, the Army electronics, communications, and sensors sector saw steady growth, albeit smaller, amounting to a 27,552% increase over the same period (McCormick & Sanders, 2022, p. 24).





Figure 4. Army OT Obligations by Platform Portfolio. Source: McCormick & Sanders (2022).

The study by McCormick and Sanders also identified a notable shift in the competition rates for Army OT obligations (McCormick & Sanders, 2022, p. 26). Initially, in FY2015 and FY2016, the competition rates were meager, with less than 10% of OT obligations being competed. As demonstrated in Figure 5, a significant change occurred over the following years, with competition rates progressively increasing each year. This trend culminated in a dramatic turnaround by FY2020 when 93% of OT obligations were competed, marking a complete reversal from the previously low competition rates.





Figure 5. Competition for Army OT Obligations. Source: McCormick & Sanders (2022).

The study revealed that most of the Army's OT agreements from FY2015 to FY2020 were executed through Picatinny Arsenal, reflecting its significant role in the DOD, as seen in Table 1. The Army Contracting Command New Jersey (ACC-NJ) alone accounted for 86% of these OT obligations (McCormick & Sanders, 2022, p. 25). Other key contracting offices involved were Redstone Arsenal, Aberdeen Proving Ground, APG Natick, and the Army Tank Automotive and Armaments Command. Together, these five offices were responsible for 91% of the Army's OTA obligations in this period, totaling \$22.6 billion (McCormick & Sanders, 2022, p. 25).



Contracting Office Rank	Contracting Office	FY 2020 Obligations (Billions)	Total Obligations 2015–2020 (Billions)
1	ACC Picatinny NJ	10.00	19.53
2	ACC Redstone Arsenal	0.97	1.27
3	ACC Aberdeen Proving Ground	0.56	0.69
4	ACC Aberdeen Proving Ground Natick	0.35	0.64
5	HQ US ARMY TACOM*	0.22	0.46
	Top 5 Total	12.1	22.59

Table 1.Top Five Army Contracting Offices. Source: McCormick &
Sanders (2022).

Between FY2015 and FY2020, a select group of vendors dominated the Army's OT obligations (see Table 2). The top five vendors, Analytic Services Incorporated, Advanced Technology International, Consortium Management Group Incorporated, National Center for Manufacturing Sciences Incorporated, and Microsoft, were responsible for a substantial portion of these obligations. They comprised \$19.8 billion, which constituted 80% of the Army's OT commitments during this period. (McCormick & Sanders, 2022, p. 27).

Expanding the focus to the top 20 vendors reveals a broader diversity, yet consortia remained predominant. (McCormick & Sanders, 2022, p. 27). Table 2 shows that of the wider group, 11 were consortia. The remainder included two major defense firms, one top-tier information technology company, two large defense corporations, two large nontraditional defense entities, and two small nontraditional defense businesses. These 11 consortia accounted for 83% of all Army OT commitments from FY2015 to FY2020. (McCormick & Sanders, 2022, p. 27). In comparison, the big five defense firms contributed 2%, Microsoft accounted for 1%, and the remaining large and small defense firms, traditional and nontraditional, collectively contributed another 1%. This distribution underscores the significant role of consortia in the Army's OT obligations during this period (McCormick & Sanders, 2022, p. 27).



Vandor			Total Obligation	
Rank	Global Vendor Name	Vendor Type	(Billions)	
1	Analytic Services	Consortium	15.34	
2	Advanced Technology International	Consortium	1.67	
3	Consortium Management Group	Consortium	1.46	
4	National Center for Manufacturing Sciences	Consortium	0.78	
5	Microsoft	Big Five IT	0.55	
	Top 5 Total		19.80	
6	System of Systems Consortium (SOSSEC)	Consortium	0.53	
7	Medical Technology Enterprise Consortium	Consortium	0.35	
8	Defense Energy Center of Excellence	Consortium	0.32	
9	Raytheon	Big Five Defense	0.25	
10	Defense Automotive Technologies Consortium	Consortium	0.24	
11	ICON PLC	Large Nontraditional	0.21	
12	Lockheed Martin	Big Five Defense	0.21	
13	Consortium for Energy, Environment, and Demilitarization	Consortium	0.18	
14	Textron	Large Defense	0.18	
15	Palantir Technologies	Large Defense	0.12	
16	Ology Bioservices	Small Nontraditional	0.12	
17	Consortium For Command, Control, Communications, and Computer Technologies	Consortium	0.11	
18	Skywater Technology Foundry	Small Nontraditional	0.11	
19	World Wide Technology Holding	Large Nontraditional	0.06	
20	Insitech	Consortium	0.06	
Top 20 Total				
Overall Army Total				

Table 2.Top 20 Vendors, Army OT Obligations. Source: McCormick &
Sanders (2022).

The results of this study provide a historical baseline to assess trends from FY2021 to FY2023. This study highlights a transformative phase in DOD procurement from 2015 to 2020, marked by a significant uptick in OT use, particularly by the Army, which saw its OT obligations soar by 161%. This period experienced a pronounced shift in procurement practices, with a dramatic 1,594% increase in Army production OT obligations in FY2020, despite prototyping still receiving the most significant funding. The research points out a realignment in OT spending priorities, with traditional areas like ordnance and missiles



losing ground to other products and knowledge-based obligations, which surged in response to COVID-19. Competition rates for Army OT obligations remarkably increased to 93% by FY2020, reflecting a move toward more competitive procurement practices. The execution of OT agreements was predominantly managed through key contracting offices like Picatinny Arsenal, highlighting the concentration of OT activities. Furthermore, the study reveals a vendor landscape dominated by a few, particularly consortia, which accounted for a substantial portion of OT obligations, indicating a critical reliance on these entities for achieving the Army's modernization and innovation objectives. This period denotes a significant shift toward more agile and responsive procurement strategies, underscoring the evolving dynamics of the DOD's engagement with industry partners to address emerging challenges.

B. DEFENSE ACQUISITION TRENDS 2023: A PRELIMINARY LOOK

Gregory Sanders, Nicholas Velazquez, Emily Hardesty, and Audrey Aldisert authored a report in December 2023, giving a preliminary look at the defense acquisition trends of 2023. Amid a rapidly evolving global threat landscape, with particular emphasis on the impacts of the ongoing war in Ukraine, Indo-Pacific tensions, and emerging conflicts in the Middle East, the DOD has been navigating through a period of significant change and adjustment. The defense acquisition system has continued to adapt to these shifts, reflecting broader strategic priorities and responding to external challenges with agility and foresight. Considering the recent release of the new National Defense Industrial Strategy, this report highlights the most recent data and trends in defense contracting, providing a foundational analysis to understand how FY2022's contracting activities, influenced by the tail end of Covid-19 responses, supply chain disruptions, inflation, and U.S. support to Ukraine, set the stage for future acquisition directions.

As global disruptions surfaced, including Russia's invasion of Ukraine in February 2022, inflation, and supply chain issues, the DOD maintained continuity in contract spending from FY2021 to FY2022, growing from \$387.1 billion to \$414.4 billion, a nominal increase of 7% which equates to 0.1% real growth after inflation adjustment (Sanders et al., 2023, p. 4). A significant portion of U.S. aid to Ukraine, totaling \$46.6



ACQUISITION RESEARCH PROGRAM Department of Defense Management Naval Postgraduate School billion as of February 2023, was facilitated through the Presidential Drawdown Authority, enabling the transfer of existing stock items without new procurement costs. Nevertheless, this approach necessitated replenishing transferred stocks and enhancing production capacities to meet unexpected demands (Sanders et al., 2023, p. 4). In FY2022, the DOD allocated \$432.5 million for Ukraine mission support, likely underestimating the expenditure on replacing transferred items.

As illustrated in Figure 6, contract obligations by product, service, and R&D categories experienced modest fluctuations. Product spending slightly increased by 1% to \$209.1 billion, matching levels seen in FY2018, while R&D expenditures grew by 0.4% to \$35.1 billion, continuing a trend of growth in six out of the last seven years (Sanders et al., 2023, p. 5). Conversely, service contracting decreased by 1% to \$169.5 billion (Sanders et al., 2023, p. 5).



Figure 6. Defense Contract Obligations by Product, Service, and R&D. Source: Sanders et al. (2023).

The report highlights that a notable downturn occurred in ordnance and missile spending, dropping by 12.8% to \$20.5 billion in FY2022, necessitating further examination amid expected increases for munitions replenishment and hypersonic missile research



(Sanders et al., 2023, p. 6). This decline included reduced guided missile spending from \$6.6 billion to \$5.1 billion (Sanders et al., 2023, p. 6). Contrarily, as depicted in Figure 7, spending on the Guided Multiple Launch Rocket System (GMLRS) surged in the first half of FY2023, indicating a potential reversal in trend (Sanders et al., 2023, p. 6). Additionally, space systems and missile defense funding experienced increases, suggesting shifting priorities toward strategic defense capabilities, notably in response to heightened missile threats, as evidenced by Russian tactics in Ukraine (Sanders et al., 2023, p. 6).



Figure 7. Defense Obligations by Platform Portfolio, FY 1990-FY 2023 Q2. Source: Sanders et al. (2023).

As depicted in Figure 8, R&D contract spending has shown consistent growth, yet the dynamics shift when considering OT arrangements. A notable increase in OT spending occurred in FY2020, mainly due to the Army's involvement in the COVID-19 pandemic response, constituting nearly half of OT expenditures that year and a considerable part in FY2021 (Sanders et al., 2023, p. 8). However, OT spending on R&D saw a significant drop of 29.3% from \$12.6 billion in FY2021 to \$8.9 billion, with declines also observed in services and products by 36.1% and 28.7%, respectively (Sanders et al., 2023, p. 8). Early data from FY2023 indicates a recovery in OT spending for products, already surpassing



the total expenditure of FY2022 in just the first half of the year. Despite this, the ongoing war in Ukraine did not trigger an increase in OT spending for ordnance and missiles, which fell by 29.4% to \$1.6 billion in FY2022, highlighting a decrease in this area despite expectations to the contrary (Sanders et al., 2023, p. 9).



Figure 8. Defense OT Obligations by Product, Service R&D Area, and Portfolio. Source: Sanders et al., (2023).

This report critically analyzes the evolving dynamics within the defense acquisition system amid a year marked by significant global disruptions. The analysis encapsulates how the DOD has navigated a complex landscape shaped by the ongoing war in Ukraine, tensions in the Indo-Pacific, emerging conflicts in the Middle East, inflation, supply chain challenges, and the residual impacts of COVID-19. Despite these challenges, the DOD demonstrated resilience and strategic foresight, evidenced by a nominal increase in contract spending and a strategic allocation of resources toward essential areas such as Ukraine support, R&D, and strategic defense capabilities. The report's detailed examination of spending trends, particularly the nuanced shifts in ordnance, missile spending, and OT



agreements, underscores the DOD's responsive adaptation to immediate needs while preparing for future demands. As the defense landscape evolves beyond the report's timeframe, the insights provided offer invaluable understanding necessary to interpret current and future acquisition strategies.

C. FY2023 BLOOMBERG GOVERNMENT CONTRACTING PLAYBOOK

The Bloomberg Government's FY2023 Government Contracting Playbook presents an insightful analysis into the future of government contracting, pinpointing six key markets poised for growth: cloud computing, artificial intelligence, and machine learning (AI/ML); base operations and logistics; business; management; and financial services, facilities services, and digital services. This forward-looking perspective guides contractors through the evolving landscape shaped by technological advancements and operational needs (Bloomberg Government, 2023, p. 8).

In cloud computing, the playbook emphasizes the critical role of cloud solutions in meeting the government's need for data security, scalability, and cost-efficiency. The demand for contractors capable of delivering seamless integration, adherence to federal standards, and sophisticated cybersecurity are highlighted as a significant opportunity and depicted in Figure 9 (Bloomberg Government, 2023, p. 8). Similarly, the AI/ML sector is identified as a transformative force, enabling government agencies to leverage data for decision-making and enhance national security. As depicted in Figure 10, the playbook suggests that contractors with AI and ML expertise are well-positioned to offer innovative solutions (Bloomberg Government, 2023, p. 8).



Technical, Policy Initiatives Driving Transition to Cloud

Pentagon moving faster since FY 18 but cloud needs are government-wide



Figure 9. Cloud Computing Market Growth. Source: Bloomberg Government (2023).



Figure 10. Artificial Intelligence and Machine Learning Market Growth. Source: Bloomberg Government (2023).

The focus on base operations and logistics underlines the importance of efficiency and support for military personnel, with opportunities for contractors to contribute to the modernization of logistics management and infrastructure improvements (Figure 11; Bloomberg Government, 2023, p. 9). The playbook also points to the necessity for specialized expertise in the area of business, management, and financial services, as seen in Figure 12, to help government agencies navigate fiscal challenges, emphasizing the role of contractors in achieving cost savings and effective management practices (Bloomberg Government, 2023, p. 9).





Figure 11. Base Operations and Logistics Market Growth. Source: Bloomberg Government (2023).



Figure 12. Business, Management, and Financial Services Market Growth. Source: Bloomberg Government (2023).

Facilities services are spotlighted as a growth area driven by the government's focus on sustainability and efficiency, presenting opportunities for contractors to modernize facilities and implement green technologies (Figure 13; Bloomberg Government, 2023, p. 10). Lastly, the playbook addresses the crucial need for digital services, indicating a priority for the government to transform its services digitally to meet public expectations and improve operational efficiency, opening avenues for contractors skilled in web development, digital platforms, and e-government services (Figure 14; Bloomberg Government, 2023, p. 10).



Facilities Maintenance, Upgrades Keep Market Scope Dynamic

Largest contracts lead to significant subcontracting across varied tasks



Figure 13. Facilities Services Market Growth. Source: Bloomberg Government (2023).



Digital Services Contract Spending Grows, So Does Government Need Modernization push likely to require continued focus on usability, efficiency

Figure 14. Digital Services Market Growth. Source: Bloomberg Government (2023).

The Bloomberg Government's FY2023 Government Contracting Playbook serves as a comprehensive guide for navigating the future of government contracting. Its analysis and graphical representations underscore the significant growth opportunities within critical markets driven by technological advancements and the government's evolving operational needs. These forecasted market growth areas provide an additional gauge on DOD initiatives and future acquisition strategies to meet them, highlighting the alignment between government priorities and the evolving landscape of contracting opportunities. Contracting opportunities, specifically using OTs, serve as a strategic approach for the DOD to quickly harness innovations in these burgeoning sectors. By enabling rapid



technological adaptation and fostering agile partnerships, OTs emerge essential for propelling the Army forward. This affirms OT's vital role in the DOD's efforts to stay ahead in a technologically advancing landscape, aligning with Army 2030s vision for modernized, agile defense mechanisms.

D. LITERATURE REVIEW SUMMARY

The insights provided by McCormick and Sanders (2022), alongside the preliminary findings from the FY2023 Defense Acquisition Trends report, encapsulate the evolving landscape of DOD procurement practices, with a notable emphasis on the Army's strategic shift toward OTs between FY2015 and FY2020. This transition, characterized by a significant increase in OT obligations and diversifying spending areas, sets a critical backdrop for this thesis. It highlights the transformative period in DOD procurement, marked by an increasing preference for innovative contracting methods, competitive bidding, and a realignment of investment priorities in response to emerging challenges and operational needs. This body of work lays the groundwork for the current study, identifying critical gaps in the literature, particularly in the nuanced understanding of OTs' role in modernization and strategic defense initiatives. By delving into these underexplored facets, this thesis aims to contribute meaningful insights into the procurement strategies that underpin the Army's adaptation to a rapidly changing global security environment.



IV. METHODS AND RESEARCH APPROACH

This chapter outlines the mixed-method research approach to analyzing qualitative and quantitative data. This approach is essential for examining prototype and production OT usage trends and discerning the potential implications of the FY2023 NDAA followon production competition amendments. Specifically, the quantitative analysis, involving systematic data examination from SAM.gov databases, is crucial for identifying trends in OT usage over time. This provides measurable, generalizable data about contract frequencies, sizes, and types, offering a macro-level understanding of the Army's OT usage patterns. Complementarily, the qualitative component is vital for delving into the nuances and contextual factors surrounding the FY2023 NDAA amendment. It allows for a deeper exploration into strategic shifts and policy implications, which the quantitative data alone might not fully capture. These methods provide a holistic view of the Army's evolving procurement strategy, combining the breadth of statistical analysis with the depth of contextual understanding.

A. QUANTITATIVE METHOD AND RESEARCH APPROACH

All quantitative data were gathered from the SAM.gov data bank, a real-time federal contracting activity database fed from the Federal Procurement Data System (FPDS; General Services Administration, 2023, p. 1). The SAM data bank offers a variety of report types to choose from. Data collection was facilitated using the "Ad Hoc Reports" feature, which enables users to generate tailored reports by selecting specific data fields and applying desired filters. Targeted database extraction was achieved using the "Other Transaction Information Report" option to guarantee the exclusive inclusion of OT data.

The data fields were strategically selected to define the data's scope and ensure a comprehensive analysis. Targeted insights were achieved by applying filters based on award and department types, focusing solely on the Department of the Army and OT awards. To comprehensively analyze the targeted data, data fields were selected that enabled an in-depth examination of financial specifics, transactional timelines, contracting offices, and contracted entities. Additionally, the chosen fields included detailed



descriptions of products or services and an assessment of the level of competition, ensuring a well-rounded and thorough analysis. To ensure consistency, all figures were converted to constant FY2020 dollars.

A time series analysis technique was used to interpret the trends and patterns in the Army OT usage data between FY2021 and FY2023. Within this framework, a comparative annual trend analysis was utilized. This approach involves comparing the data from each year to see how they change from one year to the next, such as increases, decreases, or consistent patterns. Examining these data points over a set period enabled identifying and analyzing trends, cycles, and variations in the Army's OT usage.

B. QUALITATIVE METHOD AND RESEARCH APPROACH

The FY2023 NDAA is examined using qualitative research methods, starting with the NDAA document as the primary source, offering direct insights into the latest legislative changes and priorities in 10 U.S.C. §4022. Insights from previous iterations of the NDAA are also scrutinized, providing a historical context to understand the evolution of procurement policies and practices. The viewpoints of industry-leading experts shed light on strategic shifts and policy implications, enriching the analysis with their expert opinions. The *Other Transactions Guide* is another crucial source detailing the latest procedural norms and guidelines for understanding current procurement dynamics (OUSD[A&S], 2023). Historical GAO protests related to OTs are also examined, offering a unique perspective on the challenges and disputes within procurement processes. These protests help us understand the practical implications of policy and contentious areas within procurement strategies. Cumulatively, these qualitative data sources create a multidimensional view, combining detailed, context-rich insights that complement quantitative data, providing a holistic understanding of the Army's OT usage trends considering policy adjustments.

This study employs content analysis to dissect and understand the complexities of the FY2023 NDAA and its implications on the Army's OT usage. This method systematically examines NDAA documents, the *Other Transactions Guide*, insights from industry experts, and historical OT protests. Identifying key terms, phrases, and concepts



relevant to the Army's procurement strategies allows it to distill and quantify the perspectives, themes, and subtleties that emerge from these diverse sources. This approach reveals the nuances that might not be immediately apparent and achieves a comprehensive and nuanced understanding of the Army's OT usage trends, particularly between FY2021 and FY2023.

C. METHODOLOGY SUMMARY

In this study, a mixed-method research approach was employed to integrate quantitative and qualitative findings, which is essential for a comprehensive analysis of the Army's OT usage trends in relation to the FY2023 NDAA. The comparative annual trend analysis, rooted in data from the SAM database, offers a macro-level perspective. This broad statistical view is then enriched and contextualized by the qualitative component.

Utilizing content analysis, the research delves into the strategic shifts, policy implications, and nuanced factors influencing these trends. The rationale for this integrative approach is the complementarity of quantitative data's statistical grounding with the narrative depth provided by qualitative insights. This synthesis allows the DOD to delineate the empirical trends observed in OT usage and to understand the underlying reasons and implications, thereby offering a more complete and nuanced picture of the Army's OT usage in the context of the FY2023 NDAA.



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V. ANALYSIS AND FINDINGS

This chapter examines the landscape of Army OT obligations through quantitative shifts observed over recent fiscal years and the qualitative implications of these changes within the broader context of the FY2023 NDAA. Employing a mixed-method research approach, this analysis inspects the data derived from SAM.gov databases, capturing the evolving patterns in OT usage, and contextualizes these trends within the Army's strategic procurement framework. These analytical lenses offer a comprehensive picture of the Army's OT engagements, merging the evidence of data with policy analysis insights to understand the current and future state of Army procurement.

A. QUANTITATIVE ANALYSIS AND FINDINGS

The quantitative aspect of this study charts the trajectory of prototype and production OT obligations, revealing insights into the frequency, magnitude, and variety of contracts. This empirical foundation facilitates a detailed understanding of how OT usage has adapted.

1. Army OT Obligations

As illustrated in Figure 15, the data analysis reveals significant shifts and trends in OT obligations, primarily influenced by external factors, most notably the COVID-19 pandemic. The period between FY2020 and FY2022 saw a pronounced decline in OT obligations, dropping from \$13.27 billion to \$5.44 billion, marking a 59% decrease. This downturn is particularly notable when juxtaposed against the period between FY2015 and FY2020, during which OT usage experienced a significant surge, escalating by 1,848%, as documented by the CSIS study (McCormick & Sanders, 2022, p. 20).

The dramatic fluctuations in the base and all-options value, with a peak in FY2021 at \$46.73 billion, due to an increased focus on COVID-19 responses, including substantial allocations to AstraZeneca Pharmaceuticals (\$1.65 billion) and Cue Incorporated (\$0.49 billion) among others, underscore the impact of the pandemic on the Army's financial commitments. However, the advent of the vaccine and the DOD's vaccination mandates



led to a sharp decrease in these values to -\$7.85 billion in FY2022 as COVID-19-related spending ceased. Despite these extreme changes, a modest rebound in OT usage by FY2023 was observed, with an increase of 7%, elevating the value from \$5.44 billion to \$5.84 billion. This suggests a phase of recovery and growth post-pandemic fluctuations, supporting the idea that OT obligations are poised for continued incremental growth in the future.

McCormick and Sanders's forecast, which anticipated a deceleration in growth for OT obligations post-FY2020, has been supported by subsequent trends. Their foresight was rooted in analyzing the base and all-options value patterns, suggesting that a downturn in these metrics would parallel a decline in the sum of dollars obligated. Conversely, an upturn would indicate growth (McCormick & Sanders, 2022, p. 20). Mirroring this analytical approach, my assessment of OT obligations in relation to the base and all options value further validates their hypothesis. A notable decrease in the base and all options value, plunging from \$46.73 billion to a negative \$7.85 billion—a 116% decrease in FY2022—mirrored a 23% reduction in the sum of dollars obligated during the same period, falling from \$7.08 billion to \$5.44 billion. This trend persisted into FY2023, where a significant recovery was observed; the base and all-options value rebounded by 177%, closely followed by a 7% increase in dollars obligated, from \$5.44 billion to \$5.84 billion.

This data underscores a correlation between the base and all-options value and the sum of dollars obligated. The transition from FY2022 to FY2023 reflects a phase of recovery and growth and supports the notion that OT obligations are positioned for incremental growth in the future. My analysis, in alignment with McCormick and Sanders's initial predictions, suggests a continued, though gradual, upward trajectory in OT obligations.

By the end of FY2023, the alignment between the sum of the base and all options value, \$6.13 billion, and the dollars obligated, \$5.84 billion, reflects a strategic financial management approach within the Army's OT obligations. This close relationship, indicating that financial commitments are slightly below the potential transaction value, highlights an efficient and cautious use of resources. This careful alignment suggests a disciplined budgeting and expenditure strategy and points toward an organizational



capacity for strategic planning and resource management. The Army's ability to balance potential and actual financial commitments demonstrates a proactive approach to fiscal health and operational effectiveness. This suggests future success in managing OT obligations.



Figure 15. Army OT Obligations. Adapted from SAM.gov databases.

2. OT Obligations by Type of Agreement (Prototype and Production OTs)

Production OTs have moved beyond their initial novelty, as observed in FY2019 and FY2020, and now occupy a more significant role in the Army's procurement approach. Although there has been a decline in overall OT obligations from FY2020 to FY2023, a clear and consistent increase in production OTs in relation to prototype OTs has emerged. Production OTs accounted for 2% of OT obligations in FY2020, 7% in FY2021, 9% in FY2022, and 20% in FY2023. This trend is captured in Figure 16, which shows the most substantial increase between FY2022 and FY2023. During FY2022, prototype OTs accounted for 91% of obligations, while production OTs constituted just 9%. Yet, within a



year, production OT obligations surged by 600%, rising from \$0.51 billion to \$1.19 billion, and the distribution was adjusted to 80% for prototypes and 20% for production OTs in FY2023.

This notable growth in production OTs signifies a maturing of projects, with an increasing number transitioning from the experimental prototype phase to the production-ready stage. The trend also points to a greater yield from earlier investments in prototype development. Moreover, the 600% increase in production OT obligations—climbing from \$0.51 billion to \$1.19 billion from FY2022 to FY2023—signals a substantial shift, potentially marking the commencement or scaling up of production in pivotal technology sectors. The most pronounced increases have been identified in electrical and electronic equipment components, training aids and devices, weapons, and information technology and telecommunications. The forthcoming discussion on production OT obligations by product and service will explore these sectors more thoroughly.



Figure 16. Army OT Obligations by Type of Agreement. Adapted from SAM.gov databases.



3. OT Prototype Obligations by Products and Services

The examination of prototype OT obligations from FY2021 to FY2023 unveils a pronounced transformation in the allocation patterns across different products and services, as detailed in Table 3 and Figure 17. Notably, the leading categories in FY2022 and FY2023—R&D services, training aids and devices, information technology (IT) and telecommunications, professional support services, and guided missiles—mark a significant deviation from the FY2021 priorities, which included medical laboratory testing and medical and dental equipment and supplies alongside R&D service, guided missiles, and training aids. This shift underscores a strategic pivot away from immediate healthcare needs. Despite these changes, R&D services have consistently led as the predominant category, peaking at \$7.7 billion in FY2021 before witnessing a 45% reduction to \$4.25 billion by FY2023. This enduring emphasis on R&D highlights its central role, even as spending patterns adapt.



Group Designator	Product or Service	FY2021 Obligations	FY2022 Obligations	FY2023 Obligations
		(Millions)	(Millions)	(Millions)
Group A	R&D Services	7768.77	4205.10	4252.11
Group 69	Training Aids and Devices	161.53	225.92	248.83
Category D	Information Technology and Telecommunications	95.92	240.75	179.53
Category R	Professional Support Service	80.61	89.90	55.25
Group 14	Guided Missiles	163.44	141.85	48.25
Group 7A,B,G,J	IT and Telecom - Applications	13.86	14.94	39.59
Group 13	Ammunition and Explosives	2.83	1.76	37.14
Group 65	Medical, Dental, and Veterinary Equipment and Supplies	250.58	23.97	33.20
Category F	Natural Resource Management	7.76	33.88	26.52
Group 12	Fire Control Equipment	0.00	1.02	10.75
Category K	Modification of Equipment	3.94	0.00	9.55
Group B	Special Studies/Analysis, Not R&D	143.92	-74.85	4.62
Group 16	Aerospace Craft Compenents and Accessories	0.00	0.00	4.53
Group 10	Weapons	20.32	-1.42	2.75
Group 59	Electrical and Electronic Equipment Components	4.39	4.26	1.75
Group 23	Ground Effect Vehicles, Motor Vehicles, Trailers, and Cycles	0.00	4.83	1.66
Group 15	Aerospace Craft and Structural Components	1.19	7.17	0.42
Group 19	Small Craft, Pontoons, and Floating Docks	0.00	3.70	0.01
Group J	Maintenance, Repair, and Rebuilding of Equipment	7.96	1.78	0.00
Category Q	Medical Laboratory Testing	620.14	0.00	-326.81

Table 3.Army Prototype OT Obligations by Product or Service. Adapted
from SAM.gov databases.

Between FY2021 and FY2023, significant shifts occurred in prototype OT obligations, with notable increases across various categories, underscoring the evolving priorities and strategic responses to global needs. Among these, ammunition and explosives saw the most dramatic rise, increasing by 1,211% from a modest \$2.83 million to \$37.14 million. This spike, particularly in sub-categories such as ammunition over 125MM, 75MM through 125MM, and land mines, is primarily attributed to the United States support for Ukraine and Israel.



Similarly, investments in fire control equipment experienced a remarkable upturn, with allocations expanding from nil to \$10.7 million. This category, which includes sophisticated targeting and sighting equipment, underscores a growing focus on enhancing military precision and capabilities. Additionally, the domain of natural resource management witnessed a 241% increase in obligations, jumping from \$7.8 million to \$26.5 million, signaling a strengthened commitment to addressing environmental challenges, including hazardous substance removal and abatement efforts.

The IT and telecommunications applications sector also grew significantly, surging 185% since FY2021. The most substantial obligations within this sphere were directed toward application development software, highlighting an increased reliance on digital solutions. The broader IT and telecommunications field expanded by 87%, from \$95.92 million to \$179.53 million, with the application development software as a service subcategory receiving the highest allocation at \$198 million in FY2023. This growth reflects an ongoing digital transformation and signifies the strategic importance of technological advancements in meeting contemporary challenges and objectives.

The analysis of prototype OT obligations from FY2021 to FY2023 underscores a strategic pivot in government spending toward R&D, defense, technology infrastructure, and environmental management. Post-COVID-19, there's a marked transition from emergency medical responses to strategic investments in defense and technology, aligning with the Army 2030 initiatives focused on cyber and electronic warfare, sensor technology, precision fires, and enhanced communications. R&D has consistently been a priority, a trend expected to continue. Geopolitical dynamics, especially U.S. support for Ukraine and Israel, have significantly influenced ammunition spending, which may vary with future conflict outcomes. The IT sector's obligations have almost doubled by FY2023, highlighting a growing dependency on and investment in digital infrastructure. With ongoing global competition, IT investments are anticipated to keep rising, reflecting its critical role in maintaining a competitive edge.





Figure 17. Army Prototype OT Obligations by Product or Service. Adapted from SAM.gov databases.

4. OT Production Obligations by Products and Services

The data analysis from Table 4 and Figure 18 provides a compelling narrative on the evolution of production OT obligations across different sectors from FY2021 to



FY2023. By the end of FY2023, the electrical and electronic equipment components sector emerged as the predominant recipient of these obligations, accounting for 59% of the total. This sector experienced a volatile but ultimately dramatic increase in its obligations. After a significant drop from \$356.66 million in FY2021 to \$47.52 million in FY2022, there was a remarkable surge to \$681.85 million in FY2023. It is important to note that all the obligations mentioned above were related to the Integrated Visual Augmentation System (IVAS).

Group Designator	Product or Service	FY2021 Obligations (Millions)	FY2022 Obligations (Millions)	FY2023 Obligations (Millions)	
Group 59	Electrical and Electronic Equipment Components	356.66	47.52	681.85	
Group 69	Training Aids and Devices	10.29	0.86	150.50	
Group A	R&D Services	263.15	312.95	149.67	
Group 10	Weapons	47.22	90.20	97.92	
Category D	Information Technology and Telecommunications	4.96	5.61	43.41	
Category R	Professional Support Service	28.04	17.75	15.92	
Group 13	Ammunition and Explosives	18.76	18.33	14.63	
Group 12	Fire Control Equipment	0.35	0.55	0.28	

Table 4.Army Production OT Obligations by Product or Service. Adapted
from SAM.gov databases.

Training aids and devices experienced a sharp decline in FY2022, dropping to just \$0.86 million from the previous year's \$10.29 million before catapulting to \$150.50 million in FY2023. This points to the procurement of next-generation training systems, namely the Reconfigurable Virtual Collective Trainer (RVCT), that provides virtual training across various platforms and mission profiles. R&D Services, though seeing a slight reduction from \$312.95 million in FY2022 to \$149.67 million in FY2023, maintained a strong presence throughout, indicative of a sustained commitment to innovation.

The weapons category observed a consistent increase, from \$47.22 million in FY2021 to \$97.92 million in FY2023, hinting at ongoing enhancements and new armament



acquisitions, such as the Next Generation Squad Weapon (NGSW). IT and telecommunications took a 775% leap in FY2023 to \$43.41 million, up from \$4.96 million in FY2021, reflecting an accelerating investment in digital capabilities.

Decreases in production OT obligations include professional support services, dwindling from \$28.04 million in FY2021 to \$15.92 million in FY2023. Additionally, ammunition and explosives displayed a general downward trajectory, culminating in a reduction to \$14.63 million in FY2023. This signals the conclusion of multiple ammunition production cycles.

The data spanning FY2021 to FY2023 presents a strategic narrative in production OT obligations, reflecting shifts in defense priorities. Electrical and electronic equipment components witnessed a stark rebound, suggesting a targeted infusion of capital into technological upgrades. The remarkable budget recovery in training aids and devices indicates significant investment in innovative training systems like the RVCT. R&D services, despite a slight decrease, maintained substantial backing, underscoring a steady commitment to innovation to include systems such as Army Vantage, an analytics platform, and R&D efforts toward radiation-hardened microelectronic processors to increase radiation damage resistance in space or high altitude. The weapons category's consistent growth hints at ongoing investments in armament enhancements, while the spike in IT and telecommunications obligations reflects an accelerated advancement in digital capabilities. These shifts demonstrate a recalibrated focus on technological advancement and efficiency in defense spending.





Figure 18. Army Production OT Obligations by Product or Service. Adapted from SAM.gov databases.

5. Competition of Follow-On Production OTs

Based on the data illustrated by Figure 19, there has been significant fluctuation from FY2020 to FY2023 in the proportions of follow-on production OTs that were competed versus not competed. In FY2020, non-competed contracts constituted 56%, with competed contracts making up the remaining 44%. A notable shift occurred in FY2021, where non-competed production OTs surged to 71%, considerably dwarfing the competed production OTs at 29%. However, this trend did not hold steady as FY2022 saw a decrease in non-competed contracts to 58% and an increase in competed contracts to 42%. The final year in the dataset, FY2023, displayed a slight increase in non-competed contracts to 65% and a corresponding decrease in competed contracts to 35%.





Figure 19. Competition for Production OTs. Adapted from SAM.gov databases.

This oscillation over the four years illustrates high variability in contract competitions. It is challenging to ascertain a definitive trend in the preference for competed versus non-competed production OTs due to these year-to-year changes. Despite the FY2023 NDAA implementing changes to 10 U.S.C. §4022(f)(2) and 10 U.S.C. §4022(f)(4) as of December 2022, there has not been a sufficient passage of time to determine a clear trend in connection with the FY2023 NDAA amendments. The data does, however, speak to the Army's flexibility in fluctuating between competed and non-competed OTs based on the performance of the prototype OT. Despite the current limitations of the dataset, the trends in competed versus non-competed production OTs warrant close observation, especially as the Army plans to introduce more production OTs in the upcoming years.

6. OT Obligations by Vendor

From FY2021 to FY2023, the top five vendors securing Army OT obligations were Advanced Technology International, AstraZeneca Pharmaceuticals, Microsoft Corporation, Consortium Management Group, and Sikorsky Aircraft Corporation, commanding a combined \$13.37 billion—75% of the Army's OT spend as seen in Table



ACQUISITION RESEARCH PROGRAM Department of Defense Management Naval Postgraduate School 5. Advanced Technology International led with a notable \$8.48 billion, showcasing a clear strategic emphasis on consortia for research and development. This focus on consortia has been a consistent trend, as seen from FY2015 to FY2020 when they accounted for 83% of Army OT obligations (McCormick & Sanders, 2022, p. 28). However, the latest data reflects a more diverse distribution of contracts across various types of firms, signaling a shift in the Army's procurement strategy.

The data shows a significant leaning toward consortia, with Advanced Technology International leading with \$8.48 billion between FY2021 and FY2023. This reflects a focused investment in collaborative research and development networks. This trend, which was pronounced between FY2015 and FY2020, where consortia accounted for 83% of all Army OT obligations, is echoed in the recent data, albeit with a slightly more balanced distribution among vendor types (McCormick & Sanders, 2022, p. 27). The top 20 vendors display a more comprehensive array of participants, including pharmaceuticals, big five IT companies like Microsoft Corporation, and various large and nontraditional defense firms, like Sikorsky Aircraft Corporation, Lockheed Martin Corporation, and L3 Technologies, Incorporated.

This diversification within the top 20 suggests an evolution in the Army's contracting strategy, moving slightly away from a consortia-dominated approach to encompassing a variety of firm types. The investment in IT firms has grown, with Microsoft's obligations increasing significantly from \$0.44 billion in FY2021 to \$0.85 billion in FY2023, demonstrating an enhanced focus on cybersecurity and cloud services within the Army's operational needs.

Overall, the total obligations of the top 20 vendors, amounting to \$18.50 billion over three fiscal years, depict the Army's multifaceted investment strategy. This strategy is characterized by a strong inclination toward R&D consortia, a giant swing toward technological modernization, and consistent investment in defense capabilities.



Table 5.Top 20 Vendors, Army OT Obligations. Adapted from SAM.gov
databases.

Rank	Vendor Name	Vendor Type	FY2021 Obligations (Billions)	FY2022 Obligations (Billions)	FY2023 Obligations (Billions)	Total Obligations (Billions)
1	ADVANCED TECHNOLOGY INTERNATIONAL	Consortium	3.63	2.48	2.37	8.48
2	ASTRAZENECA PHARMACEUTICALS LP	Pharmaceutical	1.65	0.00	0.00	1.65
3	MICROSOFT CORPORATION	Big Five IT	0.44	0.13	0.85	1.41
4	CONSORTIUM MANAGEMENT GROUP, INC.	Consortium	0.30	0.40	0.42	1.11
5	SIKORSKY AIRCRAFT CORPORATION	Big Five Defense	0.20	0.30	0.21	0.71
6	LOCKHEED MARTIN CORPORATION	Big Five Defense	0.16	0.16	0.23	0.55
7	BELL HELICOPTER TEXTRON INC.	Large Defense	0.19	0.16	0.14	0.49
8	CUE HEALTH INC.	Medical Testing	0.48	0.00	0.00	0.48
9	DYNETICS, INC.	Large IT	0.10	0.09	0.21	0.40
10	SYSTEM OF SYSTEMS CONSORTIUM (SOSSEC)	Consortium	0.13	0.17	0.10	0.40
TOP 10 TOTAL			7.27	3.89	4.52	15.69
11	MEDICAL TECHNOLOGY ENTERPRISE CONSORTIUM	Consortium	0.26	0.14	0.00	0.40
12	DEFENSE ENERGY CENTER OF EXCELLENCE	Consortium	0.16	0.13	0.10	0.39
13	NATIONAL ADVANCED MOBILITY CONSORTIUM, INC.	Consortium	0.00	0.10	0.26	0.36
14	COLE ENGINEERING SERVICES, INC.	Large IT	0.00	0.09	0.24	0.33
15	CLINICAL ENTERPRISE, INC.	Medical	0.27	0.00	0.00	0.27
16	ELLUME USA LLC	Medical	0.23	0.00	0.00	0.23
17	SHELTERED WINGS, INC.	Small Nontraditional	0.00	0.10	0.12	0.22
18	BATTELLE MEMORIAL INSTITUTE	Large Nontraditional	0.22	0.00	0.00	0.22
19	OLOGY BIOSERVICES, INC	Small Nontraditional	0.20	0.00	0.00	0.20
20 L3 TECHNOLOGIES, INC.		Large Defense	0.10	0.09	0.00	0.19
TOP 20 TOTAL			8.72	4.54	5.24	18.50

7. OT Obligations by Contracting Office

The data presented in Table 6 and illustrated in Figure 20 provides a comprehensive look at the Army's OT obligations by contracting office from FY2021 to FY2023, underscoring steadfast patterns and emerging shifts in the allocation of OT obligations. Picatinny Arsenal, a cornerstone in the Army's contracting ecosystem, although experiencing a notable 68% decrease in obligations from FY2021, continues to claim a significant portion of OT obligations, with 21% of the total in FY2021. Despite fluctuations, Picatinny Arsenal remains a central node in the Army's OT framework and is poised to maintain a substantial share of obligations moving forward.



Rank	Contracting Office	2021	2022	2023	Total
1	W6QK ACC-PICA	4.32	2.07	1.40	7.79
2	W6QK ACC-RSA	1.40	1.32	1.44	4.16
3	W6QK ACC-APG	0.65	0.47	1.14	2.26
4	W4MM USA JOINT MUNITIONS CMD	0.94	0.55	0.00	1.50
5	W6QK ACC-ORLANDO	0.30	0.41	0.71	1.41
6	W6J1 RCCTO BELVOIR	0.25	0.29	0.75	1.28
7	W6QK AATD CONTR OFF	0.39	0.47	0.34	1.20
8	W6QK ACC-APG DURHAM	0.76	0.04	0.08	0.88
9	W4GG HQ US ARMY TACOM	0.27	0.24	0.35	0.86
10	W6QK ACC-APG NATICK	0.78	-0.02	0.00	0.75
11	W4PZ USA MED RSCH ACQUIS ACT	0.29	0.15	0.06	0.50
12	W6QK ACC-RI	0.00	0.00	0.50	0.50
13	W6QK ACC CCDC STTC	0.14	0.00	0.00	0.14
14	W6QK ACC-APG CONT CT WASH OFC	0.04	0.04	0.06	0.14
TOTAL		10.53	6.03	6.82	23.39

Table 6.Top 14 Contracting Offices, Army OT Obligations. Adapted from
SAM.gov databases.

In addition to Picatinny Arsenal, other key contracting offices like Redstone Arsenal, Aberdeen Proving Ground (APG), Joint Munitions Command, Orlando, and Fort Belvoir collectively constitute a formidable force in the contracting landscape. They represent 79% of the Army's OT obligations, which amount to \$18.4 billion.

The data indicates an uptrend in diversification among the contracting offices; however, Picatinny Arsenal and Redstone Arsenal remain central to this landscape, comprising 51% of all OT obligations from FY2021 to FY2023. The prominent role of these two contracting offices suggests they are likely to maintain their dominance in allocating OT obligations in the coming years.





Figure 20. Obligations by Contracting Office. Adapted from SAM.gov databases.

B. QUALITATIVE ANALYSIS AND FINDINGS

The qualitative analysis probes deeper into the ramifications of recent NDAA amendments, exploring how these legislative changes shape the Army's procurement strategies. The qualitative analysis examines the strategic alignment of OT practices with the Army 2030 vision, highlighting how increased flexibility in OT usage, encouraged by the NDAA, supports the Army's objectives to harness innovation, streamline acquisition processes, and bolster national defense capabilities.


1. FY23 NDAA Analysis

The quantitative data from FY2021 to FY2023, when considered through the lens of historical trends and the FY2023 NDAA updates, appears to underscore a progression toward increased flexibility for the Services in utilizing OTs. This trend is evident in the trajectory of the data and the structural policy changes implemented by the NDAA.

Historically, the NDAA has played a central role in shaping the DOD's procurement capabilities. Each iteration has built upon previous versions to provide more agility and adaptability in response to the dynamic nature of defense needs and the rapid pace of technological innovation. The quantitative findings highlight this ongoing evolution.

The dramatic increase in OT obligations between FY2015 and FY2020, followed by a decrease due to the COVID-19 pandemic and the subsequent recovery by FY2023, exemplifies the Services' ability to adjust financial commitments rapidly and efficiently. This adaptability aligns with the incremental expansions of OT authority historically provided by successive NDAAs.

The significant rise in production OTs, especially the 600% increase in obligations from FY2022 to FY2023, signals a robust utilization beyond the prototyping phase. This trend aligns with the historical expansion of OT authority to include production and the FY2023 NDAA updates to 10 U.S.C. §4022(f)(2) and 10 U.S.C. §4022(f)(4) to give additional flexibility when transitioning from a prototype to a production OT.

The fluctuating nature of competed versus non-competed contracts demonstrates the latitude offered by the FY2023 NDAA to expedite the procurement process when competition has been satisfactorily addressed in earlier stages. This embodies the increased flexibility intended by the current NDAA changes, 10 U.S.C. 4022(f)(2) and 10 U.S.C. 4022(f)(4), that streamline the transition from prototyping to production.

The diversity of vendors engaged in securing OT obligations evidences the expansion of the defense industrial base, aligning with NDAA directives aimed at integrating non-traditional defense contractors and innovative small businesses into the DOD's procurement strategies. Concurrently, the enduring prominence of key contracting



offices, alongside a broader distribution of obligations, indicates a strategic and balanced approach to OT allocation. This upholds the robustness and adaptability of the OT framework and resonates with the NDAA's objective to decentralize procurement processes to enhance their overall agility and responsiveness to emerging defense needs.

2. Protest Analysis

Due to a lack of quantitative data regarding the trends in OT protests between FY2020 and FY2023, qualitative analysis suggests that the recent amendments to the NDAA have a nuanced impact on the landscape of OT protests. The NDAA amendments significantly reduce potential grounds for protest by streamlining the transition from prototype OTs to production OTs and eliminating the requirement for re-competition. This legislative clarity aims to facilitate a smoother procurement process, aligning with the Army's goals for rapid innovation and deployment of capabilities.

On the other hand, the direct link established by the FY2023 NDAA amendments between successful prototype completion and the award of production contracts significantly raises the stakes for initial selection in prototype OTs. The heightened competition could inadvertently increase the propensity for companies to contest decisions if they are not selected.

The qualitative evidence points towards a procurement environment where the legal mechanisms to contest OT awards may be invoked more frequently. Yet, the substantive basis for such protests is increasingly addressed through NDAA changes' legislative and procedural safeguards. This highlights a critical area for future study, particularly in how NDAA changes influence the number of protests and their decision outcomes.

3. Army 2030 Analysis

The quantitative findings from the Army OT obligations analysis resonate with the Army 2030 vision's focus on transformation through technological innovation, agility in responding to global threats and modernizing for an uncertain future (U.S. Army, 2022, p. 3).



The dramatic decrease in OT obligations during the COVID-19 pandemic, followed by a steady recovery, aligns with the Army 2030s aim for adaptable financial and operational planning. The pandemic's impact demonstrated the need for the Army to maintain flexibility in its financial commitments and the ability to pivot resources in response to emergent global challenges—traits that are fundamental to the Army 2030 vision.

The clear and consistent increase in production OTs from FY2020 to FY2023, particularly in the areas of electrical and electronic equipment components and training aids, correlates with the Army 2030s emphasis on adopting new equipment and the adoption of virtual reality and simulations technology for training (U.S. Army, 2022, p. 1). This is further emphasized by the transition from prototype to production OTs, indicative of a move toward operationalization and a focus on capability convergence across domains, as described in the Army 2030s transformative agenda (U.S. Army, 2022, p. 2).

Moreover, the shifts in prototype OT obligations—such as the increases in ammunition and explosives, fire control equipment, and IT and telecommunications—reflect the Army's strategic adjustment to counter and deter China's pacing threat and Russia's acute threat. The Army's commitment to enhancing R&D, as observed in the sustained investments despite fluctuations, supports the Army 2030 vision of integrating advanced technologies and developing new capabilities.

The increased focus on digital infrastructure, highlighted by the substantial obligations in IT and telecommunications, mirrors Army 2030s strategy to protect forces from enemy cyber and electronic attacks and ensure secure and reliable communications (U.S. Army, 2022, p. 1). This area's growth supports the vision's goal of a data-centric force capable of informed decision-making across all levels.

Though currently challenging for trend analysis, the fluctuations in the competition of follow-on production OTs suggest a responsive and dynamic contracting environment. This flexibility will be crucial as the Army of 2030 faces the need to adapt rapidly to evolving threats and technologies. Continued observation of these trends will be vital to aligning future contracting strategies with the Army's overarching goals.



Acquisition Research Program Department of Defense Management Naval Postgraduate School Lastly, the diversification observed among the top vendors for Army OT obligations and the significant roles of contracting offices such as Picatinny Arsenal and Redstone Arsenal signal a broadened approach to partnerships and consortia. This approach is consistent with the Army 2030s commitment to collaborative innovation, leveraging commercial advances, and ensuring that the Army remains at the forefront of technological and strategic development (U.S. Army, 2022, p. 2).

In conclusion, the qualitative analysis of the Army's OT obligations and contracting strategies reveals a conscientious alignment with the Army 2030 vision's priorities of advanced technology adoption, transformation of operational capabilities, and preparedness to address the complexities of future battlefields. As evidenced by the quantitative data, the Army's trajectory suggests a deliberate and strategic progression toward the envisioned state of readiness and superiority for 2030.

C. ANALYSIS AND FINDINGS SUMMARY

The analysis of Army OT obligations from FY2021 to FY2023, juxtaposed against the provisions of the FY2023 NDAA, signals a sustained historical trend toward increased flexibility in procurement. Despite external shocks, notably the COVID-19 pandemic, the Army demonstrated remarkable agility, adjusting OT obligations from a peak of \$13.27 billion in FY2020 to \$5.44 billion in FY2022 before recovering to \$5.84 billion in FY2023. This resilience and ability to rebound align with the incremental expansion of OT authority over the years, now underscored by the FY2023 NDAA updates that further streamline and accelerate the procurement process.

The data reveals a notable shift toward production OTs, increasing from 2% of the total obligations in FY2020 to 20% in FY2023, reflecting a strategic pivot from prototyping to production. This increase supports the NDAA's intent to enhance the transition of innovative technologies from development to fielding. Moreover, the Army's vendor engagement strategies and the diversified roles of contracting offices mirror the NDAA's broader goal to expand the defense industrial base and to decentralize procurement to increase operational agility.



Additionally, these findings resonate with the Army 2030 initiative, which emphasizes the adoption of cutting-edge technologies, enhancement of R&D, and integration of digital infrastructure to maintain operational superiority. The increased flexibility in OT usage supports the Army 2030s objectives of fostering agility, resilience, and technological superiority in the face of evolving global threats. Furthermore, the emphasis on engaging a broader spectrum of vendors, including non-traditional defense contractors and small businesses, aligns with the initiative's aim to leverage the best of commercial technology and innovation.



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VI. CONCLUSION AND RECOMMENDATIONS

The preceding chapters have laid a foundation for this research, starting with background information to prepare readers with the necessary context to understand the complexities of this study. This was followed by a literature review exploring previous research on defense procurement, focusing on using OTs within the DOD. The data analysis section then discussed the findings related to the Army's OT obligations, emphasizing the trends observed between FY2021 and FY2023 and examining the impact of the FY2023 NDAA amendments alongside the Army 2030 vision on procurement strategies. This chapter aims to integrate the insights gained through this investigation, answering the research questions posed at the outset. It concludes with implications of these findings for the Army's future procurement strategies and outlines recommendations for areas requiring further study.

A. RESPONSE TO RESEARCH QUESTIONS

This section summarizes the responses to the research questions established at the start of this thesis. The conclusions drawn are rooted in the data analysis conducted to evaluate prototype and production OTs trends between FY2021 and FY2023.

1. How have the Army's prototype and production OT usage trends evolved between FY2021 and FY2023?

Between FY2021 and FY2023, the Army's use of prototype and production OTs has seen marked shifts, reflecting strategic adaptations to external factors, legislative changes, and broader modernization goals. Initially impacted by the COVID-19 pandemic, OT obligations faced a significant downturn, only to see a modest recovery by FY2023, suggesting resilience and a return to incremental growth. A notable trend during this period is the strategic shift toward production OTs, which grew from 2% to 20% of total obligations, indicating a maturation of projects from development to production stages. This shift is supported by the analysis of prototype OT obligations, which reveals a realignment from immediate healthcare responses to prioritizing R&D, defense, and technology, aligning with evolving strategic priorities. These changes have granted the



Army increased flexibility to leverage OTs for technological advancements and operational effectiveness. The NDAA updates, particularly those expanding OT authority for followon production, alongside the Army 2030s focus on innovation and modernization, have facilitated these shifts in OT usage.

2. Which entities or contractors is the Army predominantly engaging with to procure prototype and production OTs between FY2021 and FY2023?

Between FY2021 and FY 2023, the top five vendors securing Army OT obligations Advanced Technology during this period were International. AstraZeneca Pharmaceuticals, Microsoft Corporation, Consortium Management Group, and Sikorsky Aircraft Corporation. These entities collectively commanded a significant portion of the Army's OT spending, illustrating a focused investment in consortia for research and development, pharmaceuticals for pandemic response, information technology for cybersecurity and cloud services, and defense firms for advanced weaponry and aircraft systems. Advanced Technology International led with a large share of obligations, showcasing the Army's strategic emphasis on leveraging consortia for collaborative R&D efforts. This approach indicates a preference for engaging a network of companies and academic institutions to drive innovation and technological advancements. The engagement with AstraZeneca Pharmaceuticals and the substantial allocation toward it underlines the immediate response to the COVID-19 health emergency. Similarly, Microsoft Corporation's significant role highlights the Army's focus on bolstering its IT infrastructure, emphasizing cybersecurity and cloud services, and aligning with modern warfare's digital demands. Sikorsky Aircraft Corporation's inclusion among the top vendors underscores the Army's investment in enhancing its aviation capabilities, pointing towards a commitment to maintaining technological superiority in air mobility and combat.

The diversity of these engagements—from consortia and pharmaceuticals to IT giants and defense contractors—reflects a multifaceted procurement strategy to address various operational needs and strategic objectives. This strategy supports current operational requirements and lays the groundwork for future capabilities, aligning with the



Acquisition Research Program Department of Defense Management Naval Postgraduate School Army's broader goals of innovation, modernization, and readiness for tomorrow's challenges.

3. How have the Army's production competition trends evolved between FY2021 and FY2022?

The Army's production OT competition trends between FY2021 and FY2022 have shown notable fluctuations in the proportions of follow-on production OTs that were competed versus those that were not. This fluctuation illustrates a dynamic approach to competition within the Army's procurement practices for production OTs, indicating a willingness to adjust strategies based on the moment's needs and the prototype OT's performance. Despite these changes, it is challenging to discern a definitive trend in preference for competed versus non-competed production OTs within this brief period.

4. Based on the analysis of trends between FY2021 and FY2023, what potential implications could the amendments in the FY2023 NDAA introduce to the Army's future prototyping and production OT usage patterns?

The amendments introduced in the FY2023 NDAA are set to influence the Army's prototyping and production OT usage patterns, signaling a new era of flexibility, innovation, and efficiency in defense procurement. The legislative changes, 10 U.S.C. §4022(f)(2) and 10 U.S.C. §4022(f)(4), are expected to facilitate a smoother transition from prototyping to production phases, thereby enabling quicker integration of successful projects into operational use. This streamlined process underscores a move toward a more dynamic application of OTs, emphasizing rapid deployment of new capabilities.

The observed shift toward increased reliance on production OTs aligns with this legislative direction, indicating a strategic focus on developing and swiftly deploying technological innovations. This trend aligns with the Army 2030 vision, which prioritizes rapid adaptation to emerging threats through technological advancement, suggesting the NDAA's provisions will bolster efforts to modernize and maintain a competitive edge.



B. CONCLUSION

Throughout this analysis, several insights have emerged regarding the Army's prototype and production OT utilization patterns between FY2021 and FY2023, within the context of the FY2023 NDAA amendments and the Army 2030 vision. The Army has demonstrated remarkable adaptability in its contracting strategies, effectively navigating the challenges posed by external factors such as the COVID-19 pandemic and responding strategically to legislative changes. The increased flexibility afforded by the NDAA amendments, particularly in facilitating the transition from prototyping to production, underscores a shift toward more dynamic procurement practices. This shift is further evidenced by the growing emphasis on production OTs, highlighting a strategic pivot from development to the rapid deployment of new capabilities. The engagement with a diverse selection of vendors, from consortia to nontraditional defense contractors and industry giants, illustrates a multifaceted approach to fostering innovation and technological advancement. This approach supports current operational needs and positions the Army to meet future challenges, aligning with the Army 2030 vision's emphasis on modernization and technological superiority. In conclusion, the Army's strategic utilization of OTs between FY2021 and FY2023, propelled by legislative support and aligned with long-term strategic visions, demonstrates a proactive approach to procurement that balances innovation with operational effectiveness. As the Army progresses, the lessons learned from this period will be valuable for informing future procurement strategies and ensuring the Army remains at the forefront of technological and operational readiness.

C. RECOMMENDATIONS

Below are recommendations for future research based on analyzing Army OT obligations and the implications of the FY2023 NDAA amendments. This research provided a comprehensive overview of prototype and production OT usage between FY2021 and FY2023, focusing on shifts in obligations, vendor engagement strategies, and legislative impacts. Future studies could extend this analysis to explore the broader implications of these trends on defense procurement and operational readiness.



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1. Future Research on Competition Trends

Future research is recommended to investigate the competition trends observed in procuring prototype and production OTs. This should include an analysis of the impact of the FY2023 NDAA and any future amendments on the balance between competed and non-competed production OTs, examining how this balance affects innovation, cost-efficiency, and the speed of procurement processes. Analyzing the long-term trends in competition could provide valuable insights into how the Army can optimize its contracting strategies to enhance operational effectiveness and technological advancement.

2. Analysis of the Integration of OT Projects into Army Operational Capabilities.

Another area for future research involves examining how projects that begin as OTs are integrated into the Army's operational capabilities and the challenges and successes associated with this process. This could include case studies of specific OT projects, analyzing factors contributing to their successful transition from prototype to production and eventual operational deployment. Understanding these pathways could improve the efficiency and effectiveness of future procurement efforts.

3. Impact of Vendor Diversification on Innovation and Technological Advancement.

Future studies should explore the effects of engaging with diverse vendors, including consortia, nontraditional defense contractors, and industry giants, on the Army's innovation outcomes and technological advancement. This research could assess how vendor diversity influences the quality, efficiency, and innovation of technological solutions procured through OTs, contributing to a deeper understanding of optimal vendor engagement strategies.



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