AU/ACSC/9694/2008-09

AIR COMMAND AND STAFF COLLEGE

AIR UNIVERSITY

BIRDS OF A FEATHER

Moving Towards a Joint Acquisition Process to Support the Intelligence, Surveillance and Reconnaissance (ISR) Enterprise.

by

Del C. Kostka
Staff Officer
National Geospatial Intelligence Agency

A Research Report Submitted to the Faculty

In Partial Fulfillment of the Graduation Requirements

Advisor: Mr. Michael P. Ivanovsky

Maxwell Air Force Base, Alabama

April 2009

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
APR 2009	**N/A**	**-**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
BIRDS OF A FEATHER: Moving Towards a Joint Acquisition Process to Support the Intelligence, Surveillance and Reconnaissance (ISR) Enterprise	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **Air Command And Staff College Air University Maxwell Air Force Base, Alabama**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release, distribution unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

The DoD lacks a Joint, cohesive process to define and validate ISR requirements, or efficiently acquire new systems to support the ISR needs of the warfighter. Efforts to integrate ISR capabilities across the DoD are hampered by diverse organizational cultures, independent requirements processes and different funding mechanisms. As a result, the complex acquisition process through which the DoD identifies, procures and implements advanced ISR systems is characterized by gaps in capabilities, growing competition for assets and systems that do not fully complement one another. This research paper uses the problem/solution methodology to define the specific challenges facing the ISR acquisition community, and recommend changes to improve the integration of ISR capabilities across the DoD and national intelligence agencies.

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT **unclassified**	b. ABSTRACT **unclassified**	c. THIS PAGE **unclassified**	**SAR**	**33**	

Disclaimer

The views expressed in this academic research paper are those of the author(s) and do not reflect the official policy or position of the US government or the Department of Defense. In accordance with Air Force Instruction 51-303, it is not copyrighted, but is the property of the United States government.

Contents

Page

Acknowledgements

A few lines to acknowledge the people whose support made this thesis possible

First, I would like to express my gratitude to the National Geospatial Intelligence Agency for providing me the time and resources to attend Air Command and Staff College. A special thanks is due Mr. Steven Wallach and the staff of the NGA Office of the Technical Executive. Without their support and commitment my year at ACSC would not have been possible. I would also like to express my deep and sincere thanks to Mr. Michael Ivanovsky and Lt. Col. Robert Bement for guiding me through the preparation of this thesis. I am grateful to both for their suggestions, their comments, and their endless patience. And finally, I would like to say thank you to my classmates in Student Squadron 21, Flights 22 and 29 for serving as my surrogate family during my stay in Montgomery. I could not ask for better wingmen!

AU/ACSC/9694/2008-09

Abstract

Birds of a Feather: Moving Towards a Joint Acquisition Process to Support the Intelligence, Surveillance and Reconnaissance (ISR) Enterprise.

By Del C. Kostka

The DoD lacks a Joint, cohesive process to define and validate ISR requirements, or efficiently acquire new systems to support the ISR needs of the warfighter. Efforts to integrate ISR capabilities across the DoD are hampered by diverse organizational cultures, independent requirements processes and different funding mechanisms. As a result, the complex acquisition process through which the DoD identifies, procures and implements advanced ISR systems is characterized by gaps in capabilities, growing competition for assets and systems that do not fully complement one another. This research paper uses the problem/solution methodology to define the specific challenges facing the ISR acquisition community, and recommend changes to improve the integration of ISR capabilities across the DoD and national intelligence agencies.

Part 1

Introduction

"Birds of a feather flock together."
- Unknown Proverb

In 2004, the United States Army issued a Critical Mission Needs Statement (CMNS) for a fleet of new Unmanned Aircraft Systems (UAS). The "Sky Warrior", as the platform was called, would be the Army's premier extended range, multi-purpose UAS to support ground operations. The Army subsequently prepared an Operational Requirements Document (ORD) to specify performance criteria for the Sky Warrior and submitted their request to the Joint Requirements Oversight Council (JROC), an all-service panel that conducts requirements analysis, validates mission needs, and recommends priorities for funding. The request was immediately challenged by the council's Air Force representative. In the Air Force's opinion, their existing MQ-1 Predator UAS, operationally deployed since 1999 and a seasoned veteran of Operations Enduring Freedom and Iraqi Freedom, could meet all of the Army's ORD performance requirements with minimal modification.[1] The Army countered that the Air Force's objection was actually a veiled attempt to retain operational control of the air space and be recognized as the "executive agent" for medium and high-altitude UAS's across the entire Department of Defense (DoD).[2] After much debate, the JROC approved the Army's requirement for a new multi-purpose UAS despite vigorous opposition from the panel's Air Force contingent.

Whatever the true motives behind the Sky Warrior dispute, it is apparent that there are major cultural differences between the US Army and US Air Force regarding the operation of UAS's. The Air Force operates UAS's through regional air component commanders, while the

Army delegates operational control of UAS's to field commanders at various levels.[3] This provides Army commanders direct control of their battlespace awareness and targeting efforts, rather than reliance on a tasking and approval mechanism. Also, the Army uses trained enlisted personnel as UAS controllers while the Air Force uses rated pilots.[4] In the Army's opinion, having UAS controllers with field experience provides a much quicker and accurate assessment of the monitored area of operation.[5]

By early 2007 the Sky Warrior disagreement had reached a boiling point. On April 19th a congressional hearing convened to review services budget requests for UAS's. The meeting quickly dissolved into a quagmire of questions and confusion. "Who is in charge?" and "Where is the authority?" asked Rep. Neil Abercombie, Chairman of the House Armed Services Air and Land Forces Subcommittee. The answer from the Government Accountability Office (GAO) was that no one in the Defense Department was exercising effective control over the services' competing programs. "This is a long-standing problem in the acquisition process," explained Michael Sullivan, director of acquisition management issues for the GAO.[6] Finally, after three years of bickering the Office of Secretary of Defense (OSD) had heard enough. On June 13, 2007 United States Deputy Defense Secretary Gordon England issued a memorandum upholding the Army's procurement rights for the Sky Warrior, but directing the two services to form a "joint integrated product team" combining the Predator and Sky Warrior efforts into a single acquisition program.[7] The Army and the Air Force have agreed to cooperate in fielding the next generation of medium-altitude, multi-role UAS's, but the contentious, stove-piped nature of the ISR acquisition process still remains.

Part 2

Thesis

The inter-service rivalry over the medium altitude UAS platform is symbolic of an antiquated funding and acquisition process that does not adequately coordinate, consolidate and manage the rapidly expanding ISR enterprise. To put it succinctly, the DoD does not have a Joint, cohesive process to define and validate ISR requirements, or efficiently acquire new systems to support warfighter needs.

The significance of this shortfall is immense. Without a unified investment management approach, each service has aggressively pursued independent ISR capabilities that are tailored to their own unique mission. The services are not required to jointly develop new ISR systems,[8] and there are vast discrepancies in the way service requirements are vetted, prioritized and funded. Efforts to integrate ISR capabilities across the DoD are hampered by diverse organizational cultures, independent requirements processes and different funding mechanisms. As a result, the complex acquisition process through which the DoD identifies, procures and implements advanced ISR systems is characterized by gaps in capabilities, growing competition for assets and systems that do not fully complement one another.[9]

While the symptoms and impacts of the ISR acquisition process are easy to identify, the exact causes are somewhat harder to determine. Without question the current process is rife with inefficiencies at virtually every level. Based upon the research outlined in this paper, the challenges facing the ISR acquisition community manifest themselves in three broad problem areas:

1. The DoD does not have a comprehensive vision or strategy for the ISR enterprise.

2. There is no unified ISR management mechanism to weigh the relative costs, benefits and risks of proposed investments.

3. The current ISR acquisition process promotes requirements definition by individual service components who may not have insight into enterprise-level priorities or viable alternatives to acquire the needed intelligence.

Scope and Purpose

The purpose of this paper is to assess and verify these three challenges facing the ISR acquisition community and to recommend changes to improve the integration of ISR capabilities across the DoD and national intelligence agencies. The objective is to advocate a joint DoD acquisition process that ensures future ISR investments reflect enterprise-level priorities and strategic goals, while providing a cost-effective baseline of advanced ISR tools, platforms and capabilities to support tactical operations.

Many organizations play a role in identifying ISR requirements, managing assets and developing new capabilities. National intelligence agencies such as the National Reconnaissance Office (NRO), the National Security Agency (NSA) and the National-Geospatial Intelligence Agency (NGA) play a vital role in supporting the DoD combat mission and are aligned under both the Secretary of Defense and the Director of National Intelligence (DNI). Although the scope of the thesis, problem statements and recommendations contained herein are limited to DoD's ISR acquisition process, the national assets are a key component of this examination due to their potential to substitute or supplement portions of the tactical ISR mission.

Part 3

Definitions

The ISR Enterprise

ISR programs are procured and managed by one of two entities, the DoD or national intelligence agencies such as the CIA, NSA or NRO. For this discussion, the term "ISR enterprise" refers to all ISR programs managed by either entity, as well as the network infrastructure, applications and databases needed to collect, exploit and transmit intelligence information.

Requirements

The term "requirement" can have distinctly different meanings within the ISR enterprise. A "mission requirement" is the actual intelligence or data that a user requires to achieve a specific objective. "Operational requirements" are the capabilities (i.e., systems and components) needed to collect that intelligence.[10] "Functional requirements" are the design constraints and minimal performance standards for the system or component being acquired.[11] Unless stated otherwise, the requirements discussed in this research paper refer to the operational requirements submitted to obtain new ISR capabilities.

"Strategic" vs "Tactical" ISR

The ISR enterprise has undergone a radical transformation in recent years. What was once an industry focused primarily on strategic surveillance from space-based platforms has exploded into a multi-sensor enterprise of commercial satellites, manned reconnaissance systems, and UAS's. Network capabilities have expanded as well, allowing real-time transmission of video and imagery directly to command centers and even to hand-held Personal

Data Assistants (PDAs). This proliferation of sensors, platforms and communication technologies has led to a revolution in the way ISR is used to support military operations.

Traditionally, the production of intelligence was based on a cycle comprised of five distinct phases; planning, collection, processing, analysis and dissemination.[12] The main focus of this cycle was analysis and forming the deep understanding of issues and adversaries that allowed precise and accurate intelligence for decision makers. This "strategic intelligence" is still a valid concept today and remains an important mission of the national intelligence community.

The success of recent intelligence technologies has created a new domain of intelligence, and a dilemma for many of today's intelligence analysts. Thanks to UAS and communication enhancements, customers now expect current and accurate situational awareness of the immediate battlespace. The production of this "tactical intelligence" does not allow the long lead time or level of detail that characterizes strategic intelligence. This often requires analysts to drastically abbreviate the analysis phase of the intelligence cycle in favor of a "see and respond" methodology. Intelligence analysts who support military customers in an operational environment now must rely more on personal experience and subject matter expertise than predictive analysis skills.

Despite the differing timelines and analysis cycle of strategic and tactical intelligence, the traditional distinction between the intelligence missions of DoD and the national intelligence community have become blurred. For example, imagery from national satellites can now be made immediately available to tactical users, while intelligence acquired at the tactical level is transmitted to national-level agencies.[13] In other words, the DoD is engaged in more strategic missions while the national intelligence community has engaged in more tactical missions.[14]

Part 4

Background and Discussion

How ISR Requirements are Defined, Vetted and Approved

The DoD and the Director of National Intelligence (DNI) have separate processes to identify future requirements. In the DoD proposals for new ISR capabilities are developed by either the Combatant Commands or by the individual services, and then submitted to the Joint Capabilities Integration and Development System (JCIDS) for vetting.[15] Within the DNI, proposals for new capabilities are developed by the national intelligence agencies and vetted through the Mission Requirements Board (MRB). Although there is rudimentary coordination between the JCIDS and MRB, no standard process exists to determine which DoD proposals will be reviewed by the MRB, or what criteria will be used to conduct such reviews.[16] The lack of protocol in vetting coincident requirements often puts the DoD and DNI at odds. For example, in 2008 the JCIDS reviewed a CENTCOM requirement for increased surveillance capabilities and determined that the shortfall would be best met by increasing the number of UAS's available to CENTCOM's service components. The MRB determined the exact same requirement could be addressed by efficiency gains in other surveillance methods.[17]

Despite the DNI's willingness to support tactical missions with national assets, many DoD requirements sponsors are reluctant to consider national systems as an alternative.[18] There are a variety of reasons why the DoD insists on acquiring in-house ISR capabilities when national agencies offer a viable alternative. For one, no single source of information exists that specifies the capability and availability of national assets, and if there were, many in the DoD community lack the security clearance needed to even evaluate select national systems.[19] Trust

and control is also an issue, as many within the DoD community are apprehensive about dependence on other system owners.

The DoD Defense Acquisition Structure

The DoD's defense acquisition structure consists of three interrelated systems that can be described in broad terms as requirements generation, resource allocation and acquisition management. As mentioned previously, the requirements component is known as the Joint Capabilities Integration and Development System (JCIDS). Created in 2003, JCIDS is a DoD-level collaborative process for identifying, assessing and prioritizing warfighter requirements.[20] Resource allocation is determined through the Planning, Programming, Budgeting and Execution System (PPBES). The PPBES is the framework through which JCIDS-vetted requirements are evaluated relative to other DoD needs and budgeted in accordance with strategic guidance and fiscal constraints.[21] The third component of the DoD defense acquisition structure is the Defense Acquisition System (DAS). As the name implies, the DAS is the management process by which the DoD initiates and oversees the actual procurement of new technologies and programs. The complexity of this three-step process combined with the magnitude of personnel, activities and funding involved in its operation can result in problems such as inefficient operations, fraud/waste/abuse, redundancy, and inadequate enforcement of laws and regulations.[22]

In the DoD, ISR requirements and need statements can be developed by defense agencies, Combatant Commands or by individual services in accordance with Title 10 responsibilities to train and equip their forces.[23] Prior to its submission into the JCIDS, a new ISR requirement must be reviewed and approved by the JROC, a Department-level panel chaired by the Vice Chairman of the Joint Chiefs of Staff and including the Vice Chiefs of the Army, Air Force and Navy, and the Assistant Commandant of the Marine Corps.[24] The charter of the JROC

is to assist the Chairman of the Joint Chiefs of Staff (CJCS) in identifying and prioritizing new requirements, consider alternatives to the stated need, and ensure that the priority assigned to the new requirement reflects established strategic guidance.[25] To assist in vetting ISR requirements, the JROC has a special subpanel known as the Battlespace Awareness Functional Capabilities Board (BA/FCB).[26] But the JROC does not have any insight into the budgeting process to ensure that JROC-validated programs are adequately funded, nor is there an oversight mechanism to ensure that the services spend appropriated funds the way the JROC intended.[27]

It is important to note that requirements definition, submission and vetting is a "capabilities-based" process, meaning the COCOM or requirements originator submits the capability shortfall they wish to address along with the minimum performance criteria needed for the eventual solution. The actual material solution for the submitted requirement is determined by a Functional Solution Analysis (FSA).[28] The FSA is the final output of the JCIDS process. In a capabilities-based system, requirements originated by the COCOM or service components must be as descriptive and accurate as possible, and baseline performance criteria should be articulated in standard terms and common frames of reference.

How Approved ISR Requirements are Funded

For budgeting purposes, the various systems that collect, process and disseminate intelligence are grouped into two major categories of programs, the National Intelligence Program (NIP) and the Military Intelligence Program (MIP). The categories are based on the customer being served, different management arrangements, and different oversight entities in Congress.[29] The NIP encompasses those strategic intelligence programs that specifically support national-level decision making.[30] NIP programs are allocated among national intelligence agencies such as the Central Intelligence Agency (CIA), the Defense Intelligence Agency (DIA),

the National Reconnaissance Office (NRO), the National Geospatial-Intelligence Agency (NGA), and the National Security Agency (NSA).[31] The MIP includes those programs that serve the ISR needs of the DoD. Some MIP programs are the responsibility of a single defense agency while others are managed by one service as an "executive agent" for the DoD.[32]

The Director of National Intelligence (DNI) has overall responsibility for preparing NIP budget submissions based on priorities established by the President, and with input from the national intelligence agencies.[33] The DNI also participates in the development of the MIP by the Secretary of Defense. Conversely, the Undersecretary of Defense for Intelligence (USD(I)) serves as the MIP Program Executive, and also ensures the NIP budget is compliant with DoD strategic objectives.[34] Thus, the DNI and USD(I) each play an essential role in the development of both the NIP and the MIP. Yet these organizations have limited time and resources, and have difficulty reviewing budget requests thoroughly.[35]

As ISR technologies continue to evolve, the distinctions between NIP and MIP programs become increasingly blurred. Some missions, such as space-based radar, are already shared by national and military process owners.[36] Although these mission interdependencies offer substantial opportunities for increased fiscal efficiency, the current budget process presents a number of significant challenges. One challenge is the unintended consequences of budget adjustments. For example, the elimination of a MIP funded reconnaissance platform might require a new reliance on a national sensor, which would now be underfunded to perform the additional tasking.[37] Shared funding arrangements present fiscal opportunities, but they have also caused rifts and schedule delays as one entity protests the percentage of funding it has to provide relative to the other.[38] Also, requirements that are uniquely Joint are slow to be identified and filled when no specific service has the responsibility to initiate a needs

statement.[39] Even when potential efficiencies are identified, determining a consolidated plan for funding and operations can be a challenge. For example, space platforms are budgeted under NIP and operated by the national intelligence agencies. Global Hawk UAS's, on the other hand, are budgeted under MIP and operated by the Air Force. These separate paths make it difficult to assess overlaps in capabilities, study trade-offs and synchronize operations.[40]

To further complicate the management and coordination of ISR programs, some elements within the DoD have turned to supplemental appropriations to obtain intelligence assets that they did not get through the established budget and planning process.[41] One such appropriation vehicle is the Defense Emergency Resource Fund (DERF), a funding initiative that allows the DoD to shift funds from a generic counterterrorism fund to specific sub-accounts.[42] Although the supplemental appropriation mechanism often results in a service obtaining a much needed capability, the practice undercuts the established budgeting and oversight process making it difficult to weigh trade-offs and adjust priorities. It also impedes long-term planning and has an erosive effect on efforts to consolidate resources.[43]

The total fiscal budget for ISR programs is difficult to assess due to the classified nature of programs, but the 2008 funding for the national intelligence systems alone exceeded 47 billion dollars.[44] With that type of massive expenditure, the need for operational efficiency and sound decision making is critical. Unfortunately, the current system provides little opportunity to compare costs or make efficiency trade-offs.

Part 5

Challenges for the ISR Acquisition Community

The unparalleled complexity of the DoD's defense acquisition structure lends itself to an abundance of problematic issues.[45] In general terms, the challenges facing the ISR acquisition community can be consolidated into three basic problem statements:

1. **The DoD does not have a comprehensive vision or strategy for the ISR enterprise.**

The lack of a clearly-defined, cohesive strategy to guide ISR investments has been a highly visible area of concern for many years. In 1995, the Senate Select Committee on Intelligence (SSCI) recommended a joint review by the Director of Central Intelligence (DCI) and the Deputy Secretary of Defense to ensure both the DoD and intelligence community were being equally served in the planning, programming and management of intelligence activities.[46] The 1997 Intelligence Authorization Act included provisions that strengthened the ability of the DCI to participate in budget development for defense-wide and tactical intelligence.[47] As part of the 2004 National Defense Authorization Act, Congress directed the Office of the Undersecretary of Defense for Intelligence (OUSD-I) to develop a comprehensive "road map" to guide development and integration of DoD ISR capabilities for fiscal years 2004 through 2018. It also called for the creation of an ISR Integration Council to address ISR integration and coordination issues in conjunction with DCI, and to contribute to the design of the ISR Roadmap.[48]

Released in 2005, the "ISR Roadmap" has provided a multitude of benefits to the DoD and intelligence community. First, it has provided a catalog of both existing and planned ISR systems to help guide investment decisions. It also outlined six specific strategic goals for the future ISR enterprise; converge DoD capabilities, attain persistent surveillance, achieve

horizontal integration of intelligence information, achieve a collaborative net-centric distributed operations infrastructure, transform ISR management capabilities, and operationalize intelligence.[49] Although the ISR Roadmap defines strategic objectives in broad terms, it does not specify future ISR requirements, identify funding priorities, or define a vetting mechanism to ensure the service's ISR investments reflect the overall strategy.[50] In short, the DoD still lacks a clearly defined vision of the future ISR enterprise to guide its ISR investments.[51]

2. There is no unified ISR management mechanism to weigh the relative costs, benefits and risks of proposed investments.

The JROC is the current enterprise-level entity for vetting requirements and addressing capability shortfalls across the DoD. The DoD agencies, COCOMs and services present their mission need statements to the JROC which evaluates each candidate requirement on a case-by-case basis. The JROC focus is on the service need and shortfall however, rather than the capabilities needed to fulfill the mission.[52] Neither the JROC nor its subpanels have the time or technical expertise to fully explore potential options for addressing the ISR capability shortfalls. Also, there is no mechanism in place to identify options, capability gaps or duplication of effort.[53]

To provide decision-makers with a mechanism to compare and contrast service requirements, the DoD is compiling an inventory of functional activities known as the Joint Capability Areas (JCA). Initiated in 2005, the JCAs are a set of standardized definitions of DoD capabilities that are divided into manageable categories.[54] The intent of the JCAs is to establish a common doctrinal language to define needs, analyze gaps in capability, and identify areas where there may be an excess of capabilities.[55] The JCAs have provided a basic framework to evaluate competing service requirements on a comparable basis.

The JROC and the JCAs provide positive momentum towards managing ISR investments from a joint, enterprise-level perspective rather than from a single service point of view. However, the DoD as a whole has not established the criteria and methods to identify the best return on investment in light of strategic goals.

3. **The current ISR acquisition process promotes requirements definition by individual service components who may not have insight into enterprise-level priorities or viable options to acquire the needed intelligence.**

Since the Goldwater-Nichols Act of 1984, the armed forces have made extraordinary progress in moving toward a joint and seamless force. Yet this joint synergy has not extended into the areas of ISR acquisition and management. Joint entities such as the JROC review and validate funding priorities, but have little input into the definition of requirements. Nor does the JROC have any oversight of the budgeting process to ensure that JROC-validated requirements are adequately funded.[56] The services are ultimately responsible for justifying funding priorities before Congress, and maintain both ownership and budgetary control over the resulting ISR assets.

Service ownership of ISR assets presents a number of inherent challenges. First, service oriented planning does not consider the full range of solutions available to fulfill operational requirements. Requirements managers at the service level often lack knowledge about national systems and can even lack the security clearance needed to review and evaluate capability options using national assets.[57] Some process owners have had prior difficulty in tasking national satellites and have complained of poor quality imagery.[58] There is also reluctance on the part of some DoD requirements sponsors to consider national ISR systems as an alternative because they simply do not want to be dependent on another system owner.

At times, service based requirements managers have also demonstrated unrealistic expectations of new ISR capabilities and have submitted requirements that are not consistent with technical levels of maturity.[59] Requirement managers who incorporate ISR technologies that are in the early stages of development increase both the risk and cost of the program, often without any significant enhancement in capability.[60]

A third issue involving service oriented ISR planning can be loosely described as "unintended consequences." Many service level ISR assets began development without a long-term plan to manage and sustain their program. As a result, funding and resources are directed toward short-term needs or "gluing" ill-suited and disparate components together in an attempt to force jointness. Also, schedule delays in some programs have forced the services to make unplanned investments in legacy systems to keep them active longer than expected.[61]

Perhaps the best example of a troubled acquisition program's cascading effect on legacy systems is the US Air Force Global Hawk high-altitude UAS. At a cost of $10 million per copy, the Global Hawk was intended to provide cost-effective reconnaissance capabilities similar to the aging U2 manned platform. The Global Hawk provides an operational advantage over national satellite assets in that it can be tasked by local commanders and launched on demand.[62] Unfortunately, the initial acquisition program had significant shortcomings, as the platform proved to be underpowered and lacked a signals intelligence capability.[63] The Air Force has now funded a $75 million per copy upgrade of the initial Global Hawk that includes greater payload and a more robust signals collection capability, but the resulting schedule delay has forced the Air Force to maintain the U2 program far beyond its projected retirement.[64]

Part 6

Conclusion and Recommendations

The current DoD acquisition process discourages the consolidation and integration of capabilities across the ISR enterprise. Since requirements and budgets are defined based on stovepipe applications, ISR system developers are forced to integrate capabilities after the fact rather than design efficient and holistic systems from the start. Congress has recognized this deficiency and authorized several significant enhancements to the acquisition process. In 2003, the capabilities-based JCIDS was implemented to submit, review and validate requirements. The 2004 National Defense Authorization Act directed the USD(I) to develop the ISR Road Map, and created the ISR Integration Council to integrate and coordinate programs across the ISR enterprise. Congress has also restructured the intelligence appropriations process to ensure coordination by the DNI and the USD(I).

Congress, the Secretary of Defense and the Director of National Intelligence would all need to be involved in any legislative activity that significantly modifies the ISR acquisition process, but less drastic modifications could also improve the integration and coordination issues that are at the heart of the ISR acquisition dilemma. The following recommendations outline four initiatives the DoD acquisition community could implement to mitigate shortfalls in the current ISR procurement environment. These suggestions are not without controversy, since implementation would inevitably require coordination, resource sharing and potential loss of decision authority by select DoD elements. The recommendations are not mutually dependent, however, and can be considered in aggregate to address portions of the ISR acquisition conundrum.

1. **Define an overall Enterprise Architecture for ISR:**

A critical shortfall in the current ISR acquisition environment is the absence of a comprehensive and clearly-defined enterprise architecture. Without a documented enterprise architecture model, the service's requirements managers are essentially making decisions based on their own personal perception of the ISR enterprise which is often not in alignment with the other service components or with the overall strategic direction of the DoD.

Within the DoD ISR community, a physical enterprise architecture for interoperability is provided by the Distributed Common Ground System (DCGS). The DCGS is a web-based global intelligence-sharing network that spans the military services and defense intelligence agencies.[65] Included in the DCGS model is a set of open interface standards known as the DCGS Integration Backbone (DIB). The DIB provides a common framework to ensure interoperability, data sharing and collaboration among all DCGS elements.[66] Although the DCGS outlines a conceptual framework to ensure new ISR capabilities can interact, it does not provide the holistic enterprise architecture in the systems engineering sense that is needed to assess requirements for new ISR capabilities and make sound investment decisions.

In the systems engineering discipline, an enterprise architecture is simply a documented model of an organizations current (as is) state, its target (to be) state, and a sequencing plan for moving between the two states.[67] In addition to a thorough inventory of strategic assets, an ISR enterprise architecture would define organizational components of the ISR enterprise and the interrelationships and interdependencies of those organizations. It would define the ISR mission of each component and document the information needed to achieve that mission. An enterprise architecture would also document a transition process for implementing new technologies in response to changing mission needs.[68]

A managed ISR enterprise architecture would offer benefits to planners, decision makers and those responsible for defining ISR requirements at the service level. A enterprise architecture would improve communication by providing a standardized vocabulary throughout the ISR community of users. It would provide a mechanism to weigh the benefits and impact of new requirements and support analysis of alternatives, risks and tradeoffs. It could also help planners discover opportunities to share ISR assets across the enterprise and identify gaps in the current infrastructure which prohibit the sharing of resources.[69]

An enterprise architecture is a living document, so one organization would be tasked with development, implementation and maintenance of the enterprise architecture life-cycle. A key provision, however, would be full participation and investment by the service components to document their mission and operations, to describe their vision of the future, and to help outline an investment and technology strategy for accomplishing their objectives. It is also essential that the ISR enterprise architecture be coordinated and endorsed by the service chiefs, USD(I) and DNI to ensure ISR acquisition activities are consistent with the strategic vision of the DoD and Intelligence Community.

2. Establish standards and baseline capabilities for sensor development, and an approved vendor registry:

At one time, the US defense establishment only acquired systems and equipment that adhered to rigid military specifications and standards. In order to incorporate the rapid expansion of technology over the past quarter century, the defense acquisition community has now adopted an open systems development approach that is based on commercial specifications and standards. Although the open systems approach has enhanced the performance and capabilities of individual systems, it has also shifted the burden of specification adherence from the acquirer to the developer.[70] This, coupled with fairly lose definitions of open system

standards, has allowed vendors to deliver their own proprietary solutions to performance requirements that are not as open as they appear to be on the surface. The development and documentation of baseline standards specific to the ISR enterprise would dramatically enhance the affordability and interoperability of ISR systems across the enterprise.

The term "standards development" is generally applied to computer systems and network protocols. In actuality, all systems have structures that allow their components and subsystems to work together to achieve the required functionality. Adherence to a well documented set of baseline standards during the design phase of ISR systems development allows these structures to interact and results in substantial cost savings, interoperability and efficiency benefits over the life cycle of the program. Although the main goal of baseline standards is interoperability, a standards-based systems development approach also reduces development cycle times, encourages higher levels of performance, provides greater adaptability to evolving requirements, and lowers the risk of technology obsolescence.[71]

A second enhancement to the source selection phase of ISR system acquisition would be the creation of an approved vendor list for program development. The intent of an approved vendor registry is not to exclude specific commercial contractors, but to ensure that the systems engineering process meets performance expectations for quality, efficiency and timeliness. Typically, a vendor registry is a living document that adds or excludes service providers based on prior performance, standards compliance and business relationships throughout their particular industry.

3. Establish a Joint ISR Requirements Agent for the DoD:

The concept of an executive level agent to oversee joint technology acquisition is not new, nor is it original to this thesis. As early as 1995 the Defense Management College called

for the establishment of a formal Joint Acquisition Executive to coordinate joint program procurement activities across the DoD.[72] Within the ISR community, this call was answered by the Intelligence Reform Act of 2003 which consolidated ISR program evaluation, assessment and recommendations under the Undersecretary of Defense for Intelligence USD(I).[73] Although this effort reflects a more centralized and coordinated approach to ISR acquisition, actual requirements for ISR capabilities are still originated and defined in accordance with DoD legacy procedures. The establishment of a Joint Requirements Agent to help validate capability gaps and oversee the definition and preparation of requirements would substantially enhance USD(I) oversight of ISR acquisition programs.

A viable candidate for a joint ISR requirements agent is United States Strategic Command (STRATCOM). In 2003, STRATCOM was given the responsibility to plan, integrate and coordinate ISR in support of DoD operations. To execute this responsibility, STRATCOM established the Joint Functional Component Command for Intelligence, Surveillance and Reconnaissance (JFCC-ISR)[74] The JFCC-ISR's current role is to match customer mission requirements with existing ISR assets and synchronize DoD, national and allied ISR collection efforts.[75] Expanding their role to include the validation and preparation of new operational and functional requirements would utilize STRATCOM's knowledge of existing ISR assets.

A second option for a joint ISR requirements agent is Joint Forces Command (JFCOM). Under this proposal, COCOMs and service components would be required to define requirements and compile mission need statements in conjunction with ISR subject matter experts at JFCOM. By channeling all new ISR requirements through JFCOM, the DoD would take advantage of JFCOM's established infrastructure for developing, evaluating and prioritizing interoperable systems.[76] As the existing DoD authority for joint concept and capabilities

development, JFCOM would provide the USD(I) with a ready mechanism to ensure future ISR requirements are defined in accordance with enterprise-level priorities rather than service-specific opinions.

4. Promote a common culture and common language across the ISR enterprise:

Perhaps the simplest, yet most perplexing, obstacle to establishing a joint, cohesive ISR acquisition process is the diversity of stove piped work cultures throughout the ISR enterprise. The proliferation of ISR programs across the DoD and the inherent overlap between tactical and strategic ISR domains has caused a great deal of confusion in regards to the future ISR operational environment. The role of the US Air Force as the executive agent for medium and high altitude UAS's has yet to be defined, and even knowledgeable insiders are unlikely to appreciate all of the fine and arbitrary distinctions among the military and national programs.[77] The DoD and the DNI need to work together to identify future ISR requirements, specify funding priorities and define clear lines of authority.

Traditionally, redundancies within the multitude of ISR programs have been extremely difficult to detect because categories, verbiage and system descriptions vary from one service to another.[78] The JCAs will help to provide the basic lexicon needed to compare and contrast programs, but the DoD still needs to establish business rules and metrics to evaluate and prioritize specific ISR programs. Also, requirements managers at the service level need to maintain the appropriate security clearance to review and evaluate capability options using national assets.

Another key to common culture is education. Exchange programs, joint exercises, collaborative working groups and formal educational programs are all ways to establish and enhance a common language and culture throughout the ISR enterprise. One initiative of

particular benefit has been the forward deployment of analysts from the national intelligence community, who have taken their front line experience and understanding of customer needs and expectations back to their parent organizations. The National Geospatial Intelligence Agency even developed a Mobile Training Team (MTT) to bring technical instruction on NGA capabilities and services directly to the warfighter. The MTTs arrive on location completely equipped to teach, bringing mobile computer labs when necessary.[79] These types of customer-focused programs have been such a success that the DNI intends to make even greater use of DoD liaisons to build relationships and connect customers to needed information, expertise and capabilities among the national assets.[80]

Conclusion

This paper provides a cursory overview of a DoD acquisition environment that struggles to coordinate, consolidate and manage the rapidly expanding ISR enterprise. It has reviewed the complex Defense Acquisition Structure, outlined the challenges facing the acquisition process, and recommended changes to improve the integration of new capabilities across the ISR community. None of these suggestions, however, are as important to the goal of an improved joint ISR acquisition process as leadership and the will to implement change. Both the DoD and the National Intelligence Community have a vested interest in securing a holistic acquisition process that ensures ISR investments reflect enterprise-level priorities. Together, they need to communicate their strategic goals for the acquisition and distribution of ISR resources, clearly map out a plan to achieve these goals and hold people accountable for meeting them. These are essential ingredients to implementing change and taking full advantage of new and incredibly advanced ISR capabilities.

END NOTES

[1] Air Force Association, *Building a House of Cards*, 1
[2]Shalal-Esa, *Pentagon to Army, Air Force*, 1
[3] Polmar, *Army Embarks*, 1
[4] Ibid, 1
[5] ACSC lecture, 24 Sept 2008
[6] Rolfson, *Air Force Draws Fire*, 1
[7] Shalal-Esa, *Pentagon to Army, Air Force*, 1
[8] GAO-07-596T, *ISR: Preliminary Observations*, 5
[9] Ibid, 1
[10] DAU Instruction, *System Engineering Fundamentals*, 26
[11] Ibid, 32
[12] Goddard and Treverton, *Assessing the Tradecraft*, 1
[13] Best and Bazen, *Intelligence Spending*, 3
[14] GAO-08-374, *ISR: DoD can Better Assess*, 16
[15] Ibid, 20
[16] Ibid, 20
[17] Ibid, 32
[18] Ibid, 38
[19] Ibid, 39
[20] Chadwick, *Defense Acquisition*, 4
[21] Ibid, 7
[22] Ibid, 1
[23] GAO-08-374, *ISR: DoD can Better Assess*, 19
[24] CJCS Instruction 5123.01B, *Charter of the Joint Requirements Oversight Council*, 1
[25] Ibid, 1
[26] GAO-08-374, *ISR: DoD can Better Assess*, 3
[27] Ibid, 8
[28] Chadwick, *Defense Acquisition*, 6
[29] Best, *ISR Programs: Issues for Congress*, 12
[30] Best and Bazen, *Intelligence Spending*, 3
[31] Best, *ISR Programs: Issues for Congress*, 13
[32] Ibid, 19
[33] Ibid, 13
[34] Best and Bazen, *Intelligence Spending*, 4
[35] AFCEA, *Information Sharing*, 4
[36] GAO-08-374, *ISR: DoD can Better Assess*, 19
[37] Best, *ISR Programs: Issues for Congress*, 21
[38] GAO-08-374, *ISR: DoD can Better Assess*, 19
[39] Ibid , 2-4
[40] Best, *ISR Programs: Issues for Congress*, 27
[41] Ibid, 8
[42] Ibid, 8
[43] Ibid, 8
[44] Congress Daily, *US Intelligence Agencies Spend*, 1
[45] Chadwick, *Defense Acquisition*, 1
[46] GAO-08-374, *ISR: DoD can Better Assess*, 2

[47] Best, *ISR Programs: Issues for Congress*, 2
[48] GAO-07-596T, *ISR: Preliminary Observations*, 7
[49] Lawlor, *Defense Intelligence Charts Couse*, 2
[50] GAO-07-596T, *ISR: Preliminary Observations*, 3
[51] GAO-08-374, *ISR: DoD can Better Assess*, 7
[52] OSD, *Joint Defense Capabilities Study, Final Report* , 2-4
[53] GAO-08-374, *ISR: DoD can Better Assess*, 26
[54] Sherman, *Pace Call for Rapid Adoption*, 1
[55] Ibid, 1
[56] GAO-08-374, *ISR: DoD can Better Assess*, 8
[57] Ibid, 38
[58] Ibid, 39
[59] US House, *Report on Challenges*, 11
[60] Ibid, 11
[61] GAO-07-596T, *ISR: Preliminary Observations*, 18
[62] Best, *ISR Programs: Issues for Congress*, 26
[63] GAO-07-596T, *ISR: Preliminary Observations*, 21
[64] Ibid, 21
[65] Goodman, *Intel Internet*, 1
[66] Ibid, 1
[67] GAO-08-374, *ISR: DoD can Better Assess*, 23
[68] CIOC, *Best Practices*, 5
[69] Ibid, 6
[70]ITT, *Goldpractices*, 1
[71] Ibid, 1
[72] Malthorpe, *The Emerging Joint System*, 308
[73] Best, *ISR Programs: Issues for Congress*, 18
[74] GAO-07-596T, *ISR: Preliminary Observations*, 6
[75] Ibid, 6
[76] Greenwald, *Joint Capability Development*, 125
[77] Best and Bazen, *Intelligence Spending*, 23
[78] Ibid, 20
[79] NGA Newsroom, *Mobile Training Teams*, 1
[80] ODNI, *Vision 2015*, 9

ACRONYMS

BA/FCB:	Battlespace Awareness Functional Capabilities Board
CENTCOM:	US Central Command
CIA:	Central Intelligence Agency
CJCS:	Chairman of the Joint Chiefs of Staff
CMNS:	Critical Mission Needs Statement
COCOM:	Combatant Commander
DAS:	Defense Acquisition System
DCI:	Director of Central Intelligence
DCGS:	Distributed Common Ground System
DERF:	Defense Emergency Resource Fund
DIA:	Defense Intelligence Agency
DIB:	DCGS Integration Backbone
DNI:	Director of National Intelligence
DoD:	Department of Defense
FSA:	Functional Solution Analysis
GAO:	Government Accountability Office
ISR:	Intelligence, Surveillance and Reconnaissance
JCA:	Joint Capabilities Area
JCIDS:	Joint Capabilities Integration and Development System
JFCOM:	US Joint Forces Command
JROC:	Joint Requirements Oversight Council
MIP:	Military Intelligence Program
MRB:	Mission Requirements Board
MTT:	Mobile Training Team
NGA:	National Geospatial Intelligence Agency
NIP:	National Intelligence Program
NRO:	National Reconnaissance Office
NSA:	National Security Agency
ORD:	Operational Requirements Document
OSD:	Office of Secretary of Defense
PDA:	Personal Data Assistant
PPBES:	Planning, Programming, Budgeting and Execution System
SSCI:	Senate Select Committee on Intelligence
STRATCOM:	US Strategic Command
UAV:	Unmanned Aerial Vehicle
USD(I):	Undersecretary of Defense for Intelligence

Bibliography

Air Force Association. "The Sky Warrior Program…Building a House of Cards." http://www.afa.org/grl/Sky_Warrior.pdf

Armed Forces Communications and Electronics Association. "*Information Sharing and Collaboration: Planning, Budgeting and Execution.*" White Paper. Oct 2007

Best, Richard A. and Bazen, Elizabeth B. *Intelligence Spending: Public Disclosure Issues*. CRS Report for Congress. Washington, DC [or D.C.]: Congressional Research Service, 2007

Best, Richard A. *Intelligence, Surveillance and Reconnaissance (ISR) Programs: Issues for Congress*. CRS Report for Congress. Washington, DC [or D.C.]: Congressional Research Service, 2005.

Chadwick, Stephen Howard. *Defense Acquisition: Overview, Issues and Options for Congress*. CRS Report for Congress. Washington, DC [or D.C.]: Congressional Research Service, 2007

Chairman of the Joint Chief of Staff Instruction 5123.01B, *Charter of the Joint Requirements Oversight Council*, 15 April 2004

Chief Information Officer Council. "A Practical Guide to Federal Enterprise Architecture." Version 1.0, February 2001. http://www.gao.gov/bestpractices/bpeaguide.pdf

Congress Daily. "US Intelligence Agencies Spend 47.5 Billion in FY08." *National Journal*, 28 October 2008. http://www.nationaljournal.com/about/congressdaily/.

Defense Acquisition University. "System Engineering Fundamentals," Ft. Belvoir, Virginia: Defense Acquisition University Press, January 2001. http://www.dau.mil/pubs/pdf/SEFGUIDE%2001-01.pdf

Department of Defense. 2007. *Persistent Intelligence, Surveillance and Reconnaissance: Planning and Direction. Joint Integrating Concept.* Version 1.0. Washington, DC: Government Printing Office

Department of Defense. 2006. *Department of Defense Planning, Programming, Budgeting and Execution (PPBE) Process – An Executive Primer*. Army Force Management School

Goddard, Bryan C. and Treverton, Gregory F. *Assessing the Tradecraft of Intelligence Analysts*. Technical Report. The Rand Corporation. Santa Monica, California. 2008

Goodman, Glen W. "*Intel Internet."* ISR Journal, Vol. 3 No. 7. August 2004.

Greenwald, Bryon. "Joint Capability Development." In *Joint Forces* course book, edited by Sharon McBride, 124-129. Maxwell AFB, AL: Air University Press, July 2008

US House. *Report on Challenges and Recommendations for United States Overhead Architecture*. 110th Cong., 2nd sess., 2008. H.R. 110-914

Intelligence, Surveillance and Reconnaissance: Preliminary Observations on DoD's Approach to Managing Requirements for New Systems, Existing Assets, and Systems Development. Testimony Before the Subcommittee on Air and Land Forces, Committee on Armed Services, House of Representatives. GAO-07-596T. Washington DC [or D.C.]: United States Government Accountability Office, April 2007.

Intelligence, Surveillance and Reconnaissance: DoD Can Better Assess and Integrate ISR Capabilities and Oversee Development of Future ISR Requirements. Report to the Subcommittee on Air and Land Forces, Committee on Armed Services, House of Representatives. GAO-08-374. Washington DC [or D.C.]: United States Government Accountability Office, March 2008.

ITT Corporation. "Defense Acquisition Commercial Specifications – Gold Practice." 2008. http://www.goldpractices.com/practices/css/index.php

Lawlor, Maryann. "Defense Intelligence Charts Course." SIGNAL Magazine, August 2005. http://www.afcea.org/signal/articles/anmviewer.asp?a=1007&print=yes

Manthorpe, William H.J. "The Emerging Joint System of Systems: A Systems Engineering Challenge and Opportunity for APL." *Johns Hopkins Applied Physics Laboratory Technical Digest*. Volume 17, No. 3 (1996): [305-313].

NGA Newsroom. "Mobile Training Teams Take GEOINT on the Road." http://www1.nga.mil/Newsroom/Pathfinder/0604/Pages/MobileTeams.aspx

Office of the Director of National Intelligence. 2007. *Vision 2015 – A Globally Networked and Integrated Intelligence Enterprise.* Washington, DC: Government Printing Office

Office of the Secretary of Defense. "Joint Defense Capabilities Study, Final Report" December 2003. http://www.paxpartnership.org/files/ACF1223.pdf

Polmar, Norman. "Army Embarks on Ambitious UAV Program." *Military*, 17 March 2008. http://www.military.com/forums/0,15240,164182,00.html

Rolfson, Bruce. "Air Force Draws Fire in Bid to Control UAVs." *Army Times*, 24 April 2007

Shalal-Esa, Andrea. "Pentagon to Army, Air Force: Work Together on UAVs," *Hanscom AFB Integrator*, 26 June 2007.

Sherman, Jason. "Pace Calls for Rapid Adoption of New Joint Capabilities Areas," *Inside the Pentagon*, 5 May 2005.

Sherman, Jason. "Pentagon Needs Advocate for New Technologies, Official Says," *Defense News*, 9 August 2004.

Additional Resources:

Command, Control, Communications and Computer Systems Directorate (J-6), Joint Net-Centric Operations Campaign Plan, Staff study, October 2006.

Office of the Undersecretary of Defense for Intelligence. “Intelligence, Surveillance and Reconnaissance Integration Roadmap” May 2005.

Sloan, Elinor. Military Transformation and Modern Warfare. Westport, CT: Greenwood Publishing Group, Inc, 2008