



# **NAVAL POSTGRADUATE SCHOOL**

**MONTEREY, CALIFORNIA**

## **THESIS**

**AN ANALYSIS OF U.S. ARMY ACQUISITION  
PROGRAM MANAGER RESPONSIBILITIES,  
AUTHORITIES, AND PROCESSES**

by

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September 2019

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**AN ANALYSIS OF U.S. ARMY ACQUISITION PROGRAM MANAGER  
RESPONSIBILITIES, AUTHORITIES, AND PROCESSES**

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## **ABSTRACT**

This project defines specific program manager (PM) responsibilities, PM authorities, and acquisition stakeholder authorities based on Department of Defense (DoD) acquisition policies and Army regulations. It maps PM processes, revealing the conflicts and issues with existing definitions, and identifies opportunities to improve the Army acquisition process. Selected primary documentation of DoD and Army regulations, DoD and Army directives, specific program acquisition documentation, supplemental data from other federal organizations, and published research are used to identify the organizational structure, responsibilities, authorities, and acquisition processes of the U.S. Army. The analysis determines how the mission aligns or conflicts with the specific authorities prescribed throughout Army policies and regulations. Furthermore, the analysis uses IDEF0 function modeling to outline the process mechanisms that serve to enforce alignment or, conversely, to promote conflict between the PM's mission and authority, and acquisition stakeholder authority.

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## LIST OF ACRONYMS AND ABBREVIATIONS

|          |                                                   |
|----------|---------------------------------------------------|
| AAE      | Army Acquisition Executive                        |
| ACC      | Army Contracting Command                          |
| AEC      | Army Evaluation Center, also ATEC                 |
| AFAR     | Army Federal Acquisition Regulation               |
| AMC      | Army Materiel Command                             |
| AP       | Acquisition Plan                                  |
| AR       | Army Regulation                                   |
| ARCIC    | Army Capabilities Integration Center              |
| ATEC     | Army Test and Evaluation Command; also AEC        |
| BFM      | Business and Financial Management                 |
| CAE      | Component Acquisition Executive                   |
| CAPE     | Office of Cost Assessment and Program Evaluation  |
| CDD      | Capability Development Document                   |
| CDID     | Capability Development and Integration Division   |
| CEO      | Chief Executive Officer                           |
| CFT      | Cross Functional Team                             |
| CIP      | Critical Intelligence Parameter                   |
| CJCSI    | Chairman of the Joint Chiefs of Staff Instruction |
| CoE, COE | Center of Excellence                              |
| CON      | Contracting                                       |
| CPAC     | Civilian Personnel Advisory Center                |
| CPD      | Capability Production Document                    |
| CRD      | Capability Requirement Document                   |
| CSA      | Chief of Staff of the Army                        |
| CSL      | Centralized Selection List                        |
| DAE      | Defense Acquisition Executive                     |
| DAS      | Defense Acquisition System                        |
| DAWIA    | Defense Acquisition Workforce Improvement Act     |
| DCR      | DOTmLPF-P Change Recommendations                  |
| DoD      | Department of Defense                             |

|           |                                                                                                                |
|-----------|----------------------------------------------------------------------------------------------------------------|
| DFAR      | Defense Federal Acquisition Regulation                                                                         |
| DODI      | Department of Defense Instruction                                                                              |
| DOTE      | Office of the Director, Operational Test and Evaluation                                                        |
| DOTmLPF-P | Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, Facilities and Policy         |
| DRPM      | Direct Reporting Program Manager                                                                               |
| DT        | Developmental Test(ing)                                                                                        |
| FAR       | Federal Acquisition Regulation                                                                                 |
| FMC       | Future Modernization Command                                                                                   |
| FMR       | Financial Management Regulation                                                                                |
| FORSCOM   | United States Army Forces Command                                                                              |
| GAO       | Government Accountability Office                                                                               |
| GO        | General Officer                                                                                                |
| GS        | General Schedule pay grades 1 to 15; GS-15 is the highest salary and has the greatest responsibility/authority |
| Hon       | Honorable                                                                                                      |
| HQDA      | Headquarters, Department of the Army                                                                           |
| ICD       | Initial Capabilities Document                                                                                  |
| IDEF      | Integrated Definition                                                                                          |
| IS        | Information System                                                                                             |
| ISP       | Information Support Plan                                                                                       |
| IT        | Information Technology                                                                                         |
| JAP       | Joint Applied Project                                                                                          |
| JCIDS     | Joint Capabilities Integration and Development System                                                          |
| JEONS     | Joint Emergent Operational Need Statement                                                                      |
| JUONS     | Joint Urgent Operational Need Statement                                                                        |
| LCSP      | Life Cycle Sustainment Plan                                                                                    |
| LOG       | Logistics                                                                                                      |
| MATDEV    | Materiel Developer                                                                                             |
| MDA       | Milestone Decision Authority                                                                                   |
| OBT       | Office of Business Transformation                                                                              |
| OIPT      | Overarching Integrated Product Teams                                                                           |

|          |                                                                                       |
|----------|---------------------------------------------------------------------------------------|
| ONS      | Operational Need Statement                                                            |
| OSD      | Office of the Secretary of Defense                                                    |
| OT       | Operational Test(ing)                                                                 |
| PALT     | Procurement Acquisition Lead Time                                                     |
| PAM      | Pamphlet                                                                              |
| PdM      | Product Manager                                                                       |
| PEO      | Program Executive Office or Officer                                                   |
| PM       | Program, Project Manager; Program Management                                          |
| PMO      | Program (or Project) Management Office                                                |
| PPBE     | Planning, Programming, Budgeting and Execution                                        |
| PQM      | Production, Quality, and Manufacturing                                                |
| PSM      | Product Support Manager                                                               |
| RDA      | Research, Development and Acquisition                                                 |
| REQ      | Requirements/User Engagement                                                          |
| SASC     | Senate Armed Services Committee                                                       |
| SES      | Senior Executive Service                                                              |
| SETA     | Systems Engineering and Technical Assistance                                          |
| SE       | Systems Engineering                                                                   |
| S&T      | Science and Technology                                                                |
| T&E      | Test and Evaluation                                                                   |
| TEMP     | Test and Evaluation Master Plan                                                       |
| TPF      | Total Package Fielding                                                                |
| TRADOC   | Training and Doctrine Command                                                         |
| UONS     | Urgent Operational Need Statement                                                     |
| USAASC   | United States Army Acquisition Support Center                                         |
| USD(ATL) | Office of the Under Secretary of Defense for Acquisition,<br>Technology and Logistics |

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## I. INTRODUCTION

On 22 April 2015, the Honorable Heidi Shyu, serving then as the Army Acquisition Executive (AAE), presented a chart titled “Acquisition Accountability Bus” to the Senate Armed Services Readiness and Management Support Subcommittee. She explained that within Army acquisition, the Program Manager (PM) is the bus driver. However, instead of being the only one in control of the bus, every one of the passengers (stakeholders) have their own steering wheel and brake. With so many “drivers” on board, what inevitably happens to the bus—to the Army program—is that it veers off course and “flips over,” Shyu said (Vergun, 2015, para. 7). The point of Shyu’s analogy, as illustrated in Figure 1, is that while Army PMs are responsible for the full life cycle of their programs, there are many other stakeholders who have been given the authority (by law or regulation) to alter a PM’s decisions regardless of the negative impact it may cause.

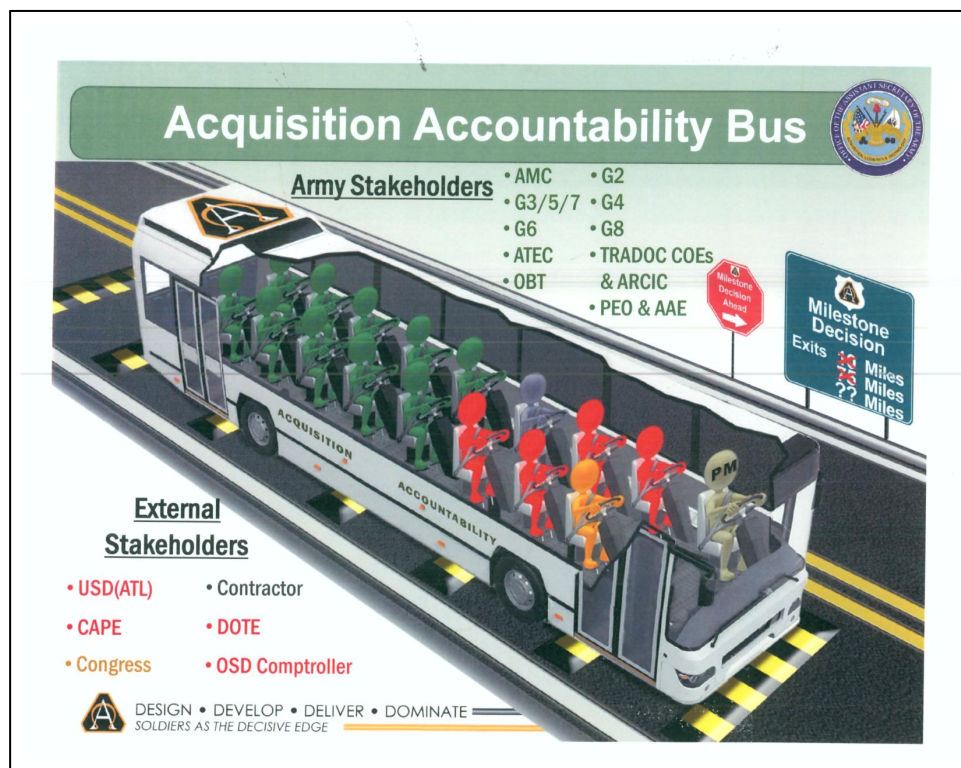


Figure 1. AAE Briefing Slide to the Senate Armed Services Committee.  
Source: Shyu (2015).

Shyu believed the Department of Defense (DoD) acquisition system often puts Army Program Managers (PMs) at a disadvantage in accomplishing their task of bringing materiel solutions to the warfighter. However, it is not clear what mechanisms for exerting authority or influence (the steering wheel and the brakes) are being utilized by external stakeholders in the manner described by Shyu. Do these external influences leverage that influence or authority because of explicit language in DoD or Army policies and regulations? The most direct way to answer that question is to exhaustively review those very policies and regulations to determine what authorities and responsibilities are specifically prescribed to the PM and the external stakeholders of their mission. We further explore this concept by answering the following questions.

- Can a systems engineering approach be used to objectively research, identify, and model the explicit authorities and responsibilities of an Army PM based on the major policy and regulation documents?
- How do the regulations and policies of the acquisition process direct or prescribe specific PM authorities and responsibilities?
- Where does that differ from the directed, implied or derivative authorities that other external stakeholders have?

#### **A. PURPOSE**

This project defines specific Program Manager (PM) responsibilities, PM authorities, and stakeholder authorities based on existing DoD acquisition policies and Army regulations. It maps PM processes, revealing any conflicts or potential issues with existing definitions and identifies opportunities to improve the Army acquisition process. An analysis of Army acquisition policies and regulations serves as the starting point for understanding the explicit responsibilities of the Army PM, primarily outlined in DoD Instruction 5000.02.

The analysis determines how the mission may align or conflict with the specific authorities prescribed throughout other Army policies and regulations. Furthermore, the analysis outlines the process mechanisms that serve to enforce alignment or, conversely,

to promote conflict between the PM's mandated mission and authority. The analysis also examines the external stakeholders' authority as explicitly stated in Army policies and regulations. Finally, it is also anticipated that the data and analysis framework will be a bridge to future comparable study within the acquisition process of the other Services or a comparable study of proposed acquisition reforms.

## **B. SCOPE**

A review of the literature included selected primary documentation of DoD and Army regulations, DoD and Army directives, specific program acquisition documentation, supplemental data from other federal organizations, and published research to identify the organizational structure, responsibilities, authorities, and acquisition processes of the U.S. Army.

In order to ensure that the scope of this effort was achievable, it was important that we focus on those documents that are most fundamental to the Army acquisition process. As a first step, we chose not to research Air Force—or Navy—specific policy. We reviewed and analyzed the following non-Army specific documents in order to establish the higher framework in which the Army regulations fit:

1. Chairman of The Joint Chiefs Of Staff Instruction (CJCSI) 3170.01I - Joint Capabilities Integration And Development System (JCIDS) and its corresponding operation manual
2. DoD Directive 5000.01, with focus on its instruction, DoD Instruction (DoDI) 5000.02
3. Financial Management Regulation (FMR) 7000.14R

The DoD Acquisition Process, also known as the “Big ‘A’ - Acquisition” process, illustrated in Figure 2, has three primary processes and stakeholders. The JCIDS is a process executed by the capability developer and the primary document is CJCSI 3170.01I. This process provides the requirement. The Planning, Programming, Budgeting and Execution Process (PPBE) is executed by the Comptroller and its primary document is the FMR. This process provides the funding. The Defense Acquisition System (DAS) is the

process executed by the materiel developer (commonly assumed to ultimately be the PM) and the primary controlling document is the DoDI 5000.02. This process provides program and acquisition direction.



Figure 2. Big “A” Acquisition Process. Source: Defense Acquisition University (n.d.).

The Army publication website, <https://armypubs.army.mil/>, contains over 529 active regulations, directives, and pamphlets. Within this set, more than 80 documents include at least some usage of the term “program manager.” Initial project work collected information from 38 of these documents, and it became clear that an appropriately thorough analysis of all 80 was not achievable, or necessarily required, to develop an effective understanding of the Army acquisition process. We selected the following ten Army documents:

1. Army Regulation 1–1 (AR 1–1), Planning, Programming, Budgeting, And Execution System
2. Army Pamphlet 10 -1 (PAM 10–1), Organization of the United States Army
3. AR 10–87, Army Commands, Army Service Component Commands, And Direct Reporting Units

4. AR 70–1, Army Acquisition Policy
5. AR 73–1, Test and Evaluation Policy
6. PAM 73–1, Test and Evaluation in Support of Systems Acquisition
7. AR 700–8, Logistics Planning Factors and Data Management
8. AR 700–127, Integrated Product Support
9. AR 700–142, Type Classification, Materiel Release, Fielding, And Transfer
10. AR 702–19; Reliability, Availability, and Maintainability

Selection of these ten documents was determined by the likelihood that each would provide insight into one or more of the primary processes of a program—requirement, funding and direction. With selection of AR 1–1, we anticipated gaining insight into funding. PAM 10–1 and AR 10–87 were expected to identify key sources of program and acquisition direction, with AR 70–1, AR 73–1 and 700–127 providing the actual process direction. AR 700–8, AR-700-142 and AR 702–19 were selected to provide more specific direction for achieving the goal of Army acquisition which is to supply materiel and services to our Soldiers so that they can accomplish their mission. A newly approved version of AR 70–1 (16 June 2017) was added to the project to determine similarity and contrast to the previous AR 70–1. These changes may also demonstrate acquisition policy changes that support or counter our hypothesis.

Documents that we did not research in detail were largely excluded because of one or more of the following reasons:

1. Overly specific to a subset of products and/or customers (example, AR 1–75 Administrative and Logistical Support of Overseas Security Assistance Organizations)
2. Overly specific to implementation (example, PAM 5–20 Competitive Sourcing Implementation Instructions)

3. Addressed a single narrow aspect of program management (example, AR 70–31 Standards for Technical Reporting)
4. Primarily the responsibility of another Army function (example, capabilities developer, AR 71–19 Warfighting Capabilities Determination)

Analysis of the data conducted during the literature review included the identification of potential conflicts within DoD and Army policy or regulations, and an exploration of the constraints imposed on PM functions. The analysis of constraints was further focused on those constraints originating from external stakeholders.

### **C. RESEARCH CHALLENGE**

The Project Management Institute was established in 1969 as a nonprofit organization and leads the project management industry by providing certifications, global standards, an industry community, training and education, thought leadership and academic research (<https://www.pmi.org/about/learn-about-pmi>). PMI’s Guide to the Project Management Body of Knowledge states that “a common vocabulary is an essential element of a professional discipline” (Project Management Institute, 2017, p. 3).

At the start of this effort, we believed this same assumption that the term “Program Manager” would be defined and used consistently among DoD and Army documents. Unfortunately, this immediately proved to be incorrect. Terminology used by the Army is both inconsistent with PMI’s standard and uses multiple variations from document to document and sometimes even with the same document.

Since 2012, PMI has published a PMI Lexicon of Project Management Terms and in this document, they define the terms portfolio, portfolio manager, program, program manager, project and project manager.

|           |                                                                                                                                             |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Portfolio | Projects, programs, subsidiary portfolios, and operations managed as a group to achieve strategic objectives. See also program and project. |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------|

|                   |                                                                                                                                                                                                                               |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Portfolio Manager | The person or group assigned by the performing organization to establish, balance, monitor, and control portfolio components in order to achieve strategic business objectives. See also program manager and project manager. |
| Program           | Related projects, subsidiary programs, and program activities managed in a coordinated manner to obtain benefits not available from managing them individually. See also program and project.                                 |
| Program Manager   | The person authorized by the performing organization to lead the team or teams responsible for achieving program objectives. See also portfolio manager and project manager.                                                  |
| Project           | A temporary endeavor undertaken to create a unique product, service, or result. See also program and project.                                                                                                                 |
| Project Manager   | The person assigned by the performing organization to lead the team that is responsible for achieving the project objectives. See also portfolio manager and program manager. (Project Management Institute, 2017, pp. 7–9)   |

When reviewing PMI's definitions, it is clear that the hierarchy is downward from the portfolio/portfolio manager, then to the program/program manager and ends with the project/project manager at the lowest level. The definition of a portfolio manager is very consistent with that of a Program Executive Officer (PEO) since PEOs are typically assigned responsibility of a single large and complex project (such as the U.S. Air Force's PEO Joint Strike Fighter) or a group of related programs (such as U.S. Army's PEO Ammunition) that are to be managed to achieve a strategic objective. Based on our analysis, the DoD uses program manager in DoD 5000.02 in a manner that is consistent with PMI's definition with 361 uses of the term and only five individual uses of similar words (acquisition manager, PM, PMO, and materiel developer). DoD 5000.02 does not use project manager and, in fact, only uses the word project three times.

Unfortunately, Army usage of terms diverges from PMI significantly. This is seen within AR 70–1, where we find the following definitions:

Program, project, or product manager—An HQDA CSL manager for a system or program. A PM may be subordinate to the AAE, PEO, or DRPM. Refers to the management level of intensity the Army assigns to a particular

weapon system or IS. As a general rule, a program manager is a GO or SES member; a project manager is an O-6, a GS-15, or the broadband or pay band equivalent; a product manager is an O-5, a GS-14, or the broadband or pay band equivalent.

Project or Product Director – An ASA (ALT)/AAE centralized selection board manager, generally for an acquisition program of record that has yet to transition to sustainment and still has cost, schedule, and performance responsibilities. As a general rule, a project director is an O-6, a GS-15, or the broadband/pay band equivalent and may be subordinate to a PEO or DRPM; a PD is an O-5, a GS-14, or the broadband/pay band equivalent and may be subordinate to a PEO, project manager, or project director (Department of the Army, 2017, p. 52).

The Army associates their highest level, GO or SES members, as program managers rather than PEOs/portfolio managers, the next level, O-6, as project managers and adds three additional layers for project directors, product managers and product directors. This adds more complexity and additional layers of bureaucracy to the acquisition process and results in more ambiguity regarding the roles, authorities and responsibilities of each level. For the purposes of this paper, we treated all levels below the PEO as synonymous with program manager.

As we conducted our searches of DoD, and especially Army documents, we found additional terms used as synonyms for “Program Manager.” We identified at least 16 different variations that we believe are synonymous, for the purposes of this effort, with the term “Program Manager.” This proved to be a major research challenge for this project.

Unique to the JCIDs documents that were reviewed was the term “Solution Sponsor” and multiple documents used a variation of “Materiel Developer”: “MATDEV”; “material development organization,” “materiel developing agencies.” An example of inconsistent usage is when AR 70-1 states that “Army PMs have overall responsibility and accountability for their systems over the entire life cycle” (Department of the Army, 2017, p. 23). On the same page, AR 70-1 states that “Army MATDEVs will establish an integrated product support program and fully address system life cycle product support” (p. 23).

The more generic terms “acquisition manager” and “activity manager” were sometimes also used. An example is when an earlier version of AR 70–1 states that “all Army acquisition managers will establish an environmental management process” (Department of the Army, 2011, p. 14).

Given that these examples treated these terms as synonyms, we expanded our search criteria to include all the derivations we found. The inconsistent use of terminology among acquisition regulations and instructions is an important finding on its own. It made analysis very challenging and certainly must have the same effect on the interpretation and implementation of these regulations, policies, and instructions.

#### **D. METHODOLOGY**

The primary objective of this research is to study and define the roles and responsibilities of an Army PM. This includes their acquisition documentation responsibilities, reporting responsibilities, stakeholder information responsibilities, and any other explicitly stated work they must perform as outlined in DoD Acquisition policies (5000.01 and 5000.02) and other major applicable regulations.

In *Engineering the Business of Defense Acquisition: An Analysis of Program Office Processes*, Pickar and Jones (2014) have outlined an IDEF0 model framework for future research and analysis of the overall processes within a Program Management Office (PMO). This research aims to develop an objective method to catalog and analyze the explicit tasks prescribed to the PM across a wide range of policies and regulations. This data set provides work inputs to the Army PM and a model of Program Office processes initially defined by Pickar and Jones.

A secondary objective is to identify, within and across different policies and regulations, any conflicts in the prescribed responsibilities and authorities of the PM. Additionally, this research captures any external stakeholder dependencies, time or resource constraints, and potential outputs to further inform the Pickar and Jones model of Program Office Processes.

The model developed provides a framework for follow-on study or expansion of the research into other branches. The analysis also provides reference material for possible future study and acquisition reform. We examined the 13 key documents (three non-Army and 10 ARs) and identified work elements that were required of the PM. The process was as follows:

- Define the Search Terms for “Program Manager”
- Search Source Documents for Explicit PM Roles and Responsibilities (Work Elements)
- Introduce and Define Application of the IDEF0 Framework
- Map the Acq. Process from a PM Perspective to Work Elements of IDEF0 Framework
- Analysis of IDEF0 Models and Observations (Chapter II)
- Analysis of PM Work Elements Data (Chapter II)

#### **1. Define the Search Terms for Program Manager**

The data collection was initiated with a search of keywords to identify PM responsibilities and authorities as identified in each document. This keyword search began with “program,” “project,” “product,” “acquisition” and “manager.” In order to overcome our research challenges, it was necessary to expand the search to include additional search terms to identify synonyms to “Program Manager” and any corresponding acronyms or common abbreviations. These included “solution sponsor,” “resource sponsor,” “acquisition manager,” “PM,” “Program Manager,” “Product Manager,” “Project Manager,” “Program Management Office,” “PMO,” “Materiel Developer,” “MATDEV,” “materiel development organization,” “materiel developing agencies,” “Activity Manager.” Table 1 identifies a subset of the data showing the usage of these terms across different documents. We identified at least 16 different variations within the literature that we believe are synonymous for “Program Manager” in regard to how they impact roles and responsibilities of an Army PM.

A database was created to capture the data extracted from each document. The initial data capture included the page number, paragraph number, quoted paragraph text, and comments that identify specific items with significantly positive or negative value to defining program manager responsibilities or authorities.

Table 1. Synonyms for PM by Source Document

| Document          | solution sponsor | resource sponsor | acquisition manager | PM   | Program Manager | Product Manager | Project Manager | PdM | PgM | Program Management Office | PMO | Materiel Developer | MATDEV | materiel development organization | materiel developing agencies | Activity Manager | # synonyms used |
|-------------------|------------------|------------------|---------------------|------|-----------------|-----------------|-----------------|-----|-----|---------------------------|-----|--------------------|--------|-----------------------------------|------------------------------|------------------|-----------------|
| CJCSI 3170.011    | 2                |                  |                     |      |                 |                 |                 |     |     |                           |     |                    |        |                                   |                              |                  | 1               |
| Manual for JCIDS  | 15               | 2                |                     | 22   | 2               |                 |                 |     |     |                           |     |                    |        |                                   |                              |                  | 4               |
| DoDI 5000.01      |                  |                  | 6                   | 21   | 1               |                 |                 |     |     |                           |     | 1                  | 1      |                                   |                              |                  | 3               |
| DoDI 5000.02      |                  |                  | 1                   | 2    | 361             |                 |                 |     |     |                           |     |                    |        |                                   |                              |                  | 5               |
| FMR               |                  |                  | 1                   |      | 32              |                 | 21              | 21  | 2   | 6                         | 6   |                    |        |                                   |                              | 5                | 6               |
| AR 1-1            |                  |                  |                     |      | 1               | 2               | 1               | 13  |     |                           |     |                    |        |                                   |                              |                  | 2               |
| PAM 10-1          |                  |                  |                     | 1    | 1               | 2               | 1               |     |     |                           |     | 5                  |        |                                   |                              |                  | 5               |
| AR 10-87          |                  |                  |                     |      | 3               | 1               | 1               |     |     |                           |     | 3                  |        |                                   |                              |                  | 4               |
| AR 70-1 (Current) |                  |                  | 2                   | 151  | 12              | 16              | 11              |     |     | 1                         | 5   | 11                 | 63     |                                   |                              |                  | 9               |
| AR 70-1 (New)     |                  |                  |                     | 25   | 9               | 4               | 1               |     |     | 1                         | 5   | 1                  |        |                                   |                              |                  | 7               |
| PAM 70-3          |                  |                  | 4                   | 400  | 15              | 23              | 14              |     |     | 1                         | 49  | 11                 | 235    |                                   | 1                            |                  | 10              |
| AR 73-1           |                  |                  |                     | 24   | 8               | 2               | 4               |     |     |                           |     | 11                 | 83     |                                   |                              |                  | 6               |
| PAM 73-1          |                  |                  | 1                   | 325  | 40              | 3               | 8               |     |     | 2                         | 3   | 40                 | 308    |                                   |                              |                  | 9               |
| AR 700-8          |                  |                  |                     |      |                 |                 |                 |     |     |                           |     |                    |        |                                   |                              |                  | 0               |
| AR 700-127        |                  |                  |                     | 2    |                 |                 | 4               |     |     |                           |     | 2                  | 193    |                                   |                              |                  | 4               |
| AR 700-142        |                  |                  |                     | 167  | 4               |                 |                 |     |     |                           |     | 3                  | 19     |                                   |                              |                  | 4               |
| AR 702-19         |                  |                  |                     | 9    | 1               | 3               | 1               |     |     |                           |     | 72                 |        | 1                                 |                              |                  | 6               |
| Total Usages      | 17               | 2                | 15                  | 1149 | 490             | 56              | 67              | 34  | 2   | 11                        | 69  | 160                | 901    | 1                                 | 1                            | 5                |                 |

## 2. Search Source Documents and Identify Explicit PM Functions (Work Elements)

Each source document was scrubbed against all of our defined search terms. Each match was then reviewed to determine if a specific role or responsibility was prescribed to the PM. If so, then other contextual and meta-data was captured to help classify the role or responsibility.

The resulting data set from the 13 source documents, a sample of which is shown in Table 2, shows that we identified 82 work elements and the 931 times those elements showed up across all of the documents. The full data set, available in Appendix A, also shows how we later mapped each work element to a corresponding IDEF node.

Table 2. Work Element Data by Source Document

| ID  | WORK ELEMENT                              | IDEF     | Element                | A0 | AX | JCIDS JAN15 | Dod5000 | AR | PAM 11 | AR 71 | NEW AR 71 | AR 73 | PAM 73 | AR 700 | AR 700-1 | AR 700-1 | AR 702 | FI  | TOTAL |
|-----|-------------------------------------------|----------|------------------------|----|----|-------------|---------|----|--------|-------|-----------|-------|--------|--------|----------|----------|--------|-----|-------|
| 1   | Develop and support POM Budgets           | Output   | POM-R                  | A1 | 2  | 0           | 1       | 0  | 0      | 5     | 0         | 0     | 0      | 0      | 3        | 2        | 0      | 3   | 14    |
| 2   | Exercise fund-control responsibility      | Function | Execute Resources      | A2 | 2  | 0           | 1       | 0  | 0      | 1     | 0         | 0     | 0      | 0      | 0        | 0        | 0      | 11  | 13    |
| 3   | Develop and maintain POE                  | Output   | LCCE                   | A1 | 2  | 0           | 2       | 0  | 0      | 2     | 3         | 0     | 0      | 0      | 1        | 0        | 0      | 8   | 8     |
| 4   | Fund testing                              | Function | Execute Resources      | A2 | 2  | 0           | 0       | 0  | 0      | 3     | 0         | 4     | 0      | 0      | 0        | 0        | 0      | 7   | 7     |
| 5   | Develop and execute LCSP                  | Output   | Acq Docs               | A1 | 3  | 0           | 30      | 0  | 0      | 37    | 6         | 0     | 0      | 0      | 75       | 6        | 0      | 154 | 154   |
| 5B  | Develop and execute LCSP                  | Output   | Cont Regt              | A2 | 3  |             |         |    |        |       |           |       |        |        |          |          |        |     |       |
| 6   | Develop and execute TDS / SEP             | Output   | Acq Docs               | A1 | 3  | 1           | 40      | 0  | 0      | 75    | 2         | 0     | 0      | 0      | 20       | 3        | 0      | 0   | 141   |
| 6B  | Develop and execute TDS / SEP             | Output   | Cont Regt              | A2 | 3  |             |         |    |        |       |           |       |        |        |          |          |        |     |       |
| 7   | Develop and execute AS                    | Output   | Acq Strat              | A1 | 3  | 0           | 32      | 0  | 1      | 27    | 2         | 0     | 0      | 0      | 9        | 0        | 0      | 0   | 71    |
| 7B  | Develop and execute AS                    | Output   | Cont Regt              | A2 | 3  |             |         |    |        |       |           |       |        |        |          |          |        |     |       |
| 8   | Develop and execute TEMP                  | Output   | Acq Docs               | A1 | 3  | 0           | 47      | 0  | 0      | 11    | 0         | 1     | 4      | 0      | 4        | 2        | 1      | 0   | 79    |
| 8B  | Develop and execute TEMP                  | Output   | Cont Regt              | A2 | 3  |             |         |    |        |       |           |       |        |        |          |          |        |     |       |
| 9   | Develop and monitor APB                   | Output   | Acq Docs               | A1 | 3  | 0           | 6       | 0  | 0      | 7     | 0         | 0     | 0      | 0      | 1        | 0        | 0      | 0   | 14    |
| 9B  | Develop and monitor APB                   | Output   | Cont Regt              | A2 | 3  |             |         |    |        |       |           |       |        |        |          |          |        |     |       |
| 10  | Develop and execute AP                    | Output   | Acq Plan               | A1 | 4  | 0           | 1       | 0  | 0      | 9     | 0         | 0     | 0      | 0      | 2        | 0        | 0      | 0   | 12    |
| 10B | Develop and execute AP                    | Output   | CDRL                   | A2 | 4  |             |         |    |        |       |           |       |        |        |          |          |        |     |       |
| 11  | Develop and maintain LCCE                 | Output   | LCCE                   | A1 | 2  | 0           | 0       | 0  | 0      | 1     | 1         | 0     | 0      | 0      | 0        | 9        | 0      | 0   | 11    |
| 12  | Report CCA compliance                     | Function | Execute Acquisition    | A2 | 3  | 0           | 1       | 0  | 0      | 3     | 1         | 0     | 0      | 0      | 0        | 0        | 0      | 0   | 5     |
| 13  | Develop and implement CARD                | Output   | LCCE                   | A1 | 2  | 0           | 3       | 0  | 0      | 0     | 0         | 0     | 0      | 0      | 1        | 0        | 0      | 0   | 4     |
| 14  | Comply with policy                        | Control  | Policy                 | A1 |    | 0           | 5       | 0  | 0      | 0     | 21        | 0     | 3      | 0      | 1        | 0        | 0      | 6   | 36    |
| 14B | Comply with policy                        | Control  | Policy                 | A2 |    |             |         |    |        |       |           |       |        |        |          |          |        |     |       |
| 14C | Comply with policy                        | Control  | Policy                 | A3 |    |             |         |    |        |       |           |       |        |        |          |          |        |     |       |
| 15  | Propose cost reductions                   | Function | Plan Resources         | A1 | 2  | 0           | 1       | 0  | 0      | 0     | 0         | 0     | 0      | 0      | 1        | 0        | 0      | 0   | 2     |
| 16  | Provide corrective actions                | Function | Execute Acquisition    | A2 | 3  | 0           | 0       | 0  | 0      | 0     | 0         | 0     | 0      | 0      | 0        | 0        | 2      | 0   | 2     |
| 17  | Prepare programs for decisions            | Function | Streamline Acquisition | A3 | 1  | 0           | 1       | 0  | 0      | 0     | 0         | 0     | 0      | 0      | 0        | 0        | 0      | 0   | 1     |
| 18  | Field systems                             | Output   | Fielded System         | A2 | 3  | 0           | 1       | 0  | 0      | 1     | 0         | 0     | 0      | 0      | 2        | 45       | 0      | 0   | 49    |
| 19  | Conduct Logistics Demonstration           | Output   | Sustainment            | A2 | 3  | 0           | 0       | 0  | 0      | 0     | 0         | 1     | 0      | 0      | 10       | 0        | 0      | 0   | 11    |
|     | Supply Basis of Issue Plan Feeder         |          |                        |    |    | 0           | 0       | 0  | 0      | 0     | 0         | 0     | 0      | 0      | 7        | 1        | 0      | 0   | 8     |
| 20  | Data                                      | Output   | Sustainment            | A2 | 3  | 0           |         |    |        |       |           |       |        |        |          |          |        |     |       |
| 21  | Conduct Core Dept Assessment              | Output   | Sustainment            | A2 | 3  | 0           | 1       | 0  | 0      | 5     | 0         | 0     | 0      | 0      | 1        | 0        | 0      | 0   | 7     |
| 22  | Control and account for property          | Output   | Sustainment            | A2 | 3  | 0           | 0       | 0  | 0      | 0     | 1         | 0     | 0      | 0      | 0        | 6        | 0      | 0   | 7     |
| 23  | Char PSM IPT                              | Function | Manage Stakeholders    | A2 | 4  | 0           | 0       | 0  | 0      | 0     | 0         | 0     | 0      | 0      | 4        | 0        | 0      | 0   | 4     |
|     | Conduct Integrated Product Support        |          |                        |    |    |             |         |    |        |       |           |       |        |        |          |          |        |     |       |
| 24  | Analysis                                  | Output   | Sustainment            | A2 | 3  | 0           | 0       | 0  | 0      | 0     | 0         | 0     | 0      | 0      | 4        | 0        | 0      | 0   | 4     |
| 25  | Develop and conduct training              | Output   | Sustainment            | A2 | 3  | 0           | 0       | 0  | 0      | 0     | 0         | 0     | 0      | 0      | 1        | 3        | 0      | 0   | 4     |
| 26  | Obtain Safety Confirmation                | Output   | Sustainment            | A2 | 3  | 0           | 0       | 0  | 0      | 0     | 0         | 0     | 0      | 0      | 0        | 4        | 0      | 0   | 4     |
|     | Obtain transportability and deployability |          |                        |    |    |             |         |    |        |       |           |       |        |        |          |          |        |     |       |
| 27  | assessment                                | Output   | Sustainment            | A2 | 3  | 0           | 0       | 0  | 0      | 1     | 1         | 0     | 0      | 0      | 0        | 2        | 0      | 0   | 4     |
| 28  | Leverage or Develop and Field TMDE        | Output   | Sustainment            | A2 | 3  | 0           | 0       | 0  | 0      | 0     | 0         | 0     | 0      | 0      | 0        | 2        | 0      | 0   | 2     |

### 3. Define IDEF0 Framework and Apply to Data Set

IDEF0 is a function modeling method that originated from work funded by the United States Air Force to improve the efficiency of manufacturing processes using computers. IDEF stands for *Icam DEFinition*, and ICAM in turn stands for *Integrated Computer Aided Manufacturing*. IDEF0 was formally defined by the Federal Information Processing Standards Publication 183 (FIPS 183) but this standard was withdrawn in September 2008 and the method is open and no longer maintained (IDEF0, n.d.). Knowledge Based Systems, Inc. (KBSI) sells software based on the IDEF methods, including IDEF0, and they provide the original FIPS 183 document as well as other general information on the website, [www.idef.com](http://www.idef.com).

IDEF0 is a useful tool for this effort because it enables the deconstruction of a complex system into manageable functions that can be more effectively analyzed and communicated. Furthermore, “the graphical elements of IDEF0 are very simple—just boxes and arrows” (Feldmann, 1998, p. 2).

Figure 3 shows the basic IDEF methodology. The function name in each box is stated as a verb with descriptive nouns to make the name as informative as necessary, such as “Write Acquisition Strategy.” Arrows point into the left of the box to convey “Inputs” to the function and arrows pointing out of the right side to convey the function’s “Outputs.”

Arrows pointing down into the box are “Controls” on the function that limit or constrain the function such as specific laws or regulations. Arrows pointing up and into the box are “Mechanism” representing the “means” for completing the function. These mechanisms are often personnel or defined business processes.

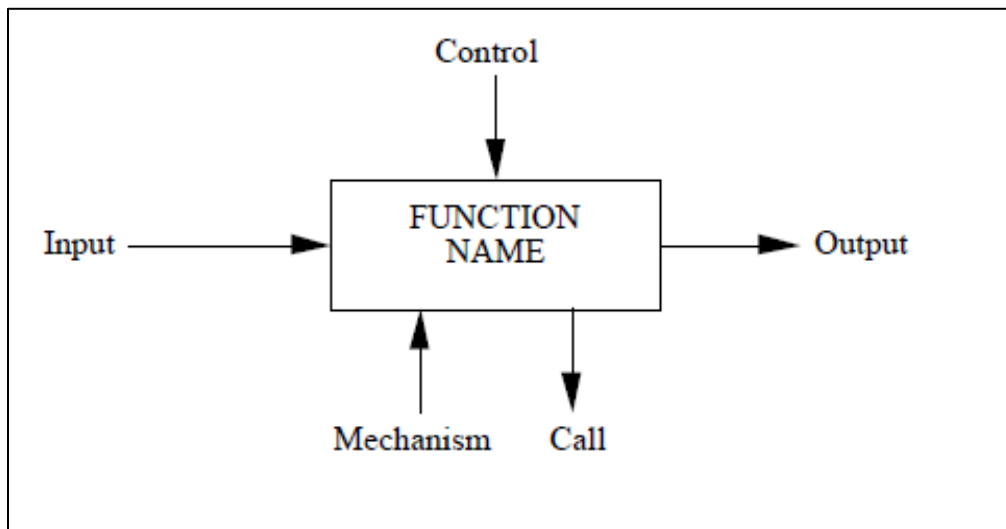


Figure 3. IDEF Methodology. Source: Pickar and Jones (2014).

Pickar and Jones (2014) propose a more descriptive model specific to program management, as shown in Figure 4, that replaces “Function” with “Work,” and “Inputs” defined as “Requests for Information / Decision.” The “Output” is represented as a “Decision,” “Controls” described as “Time/Other Constraints” and “Mechanisms” as “PMO Resources.”

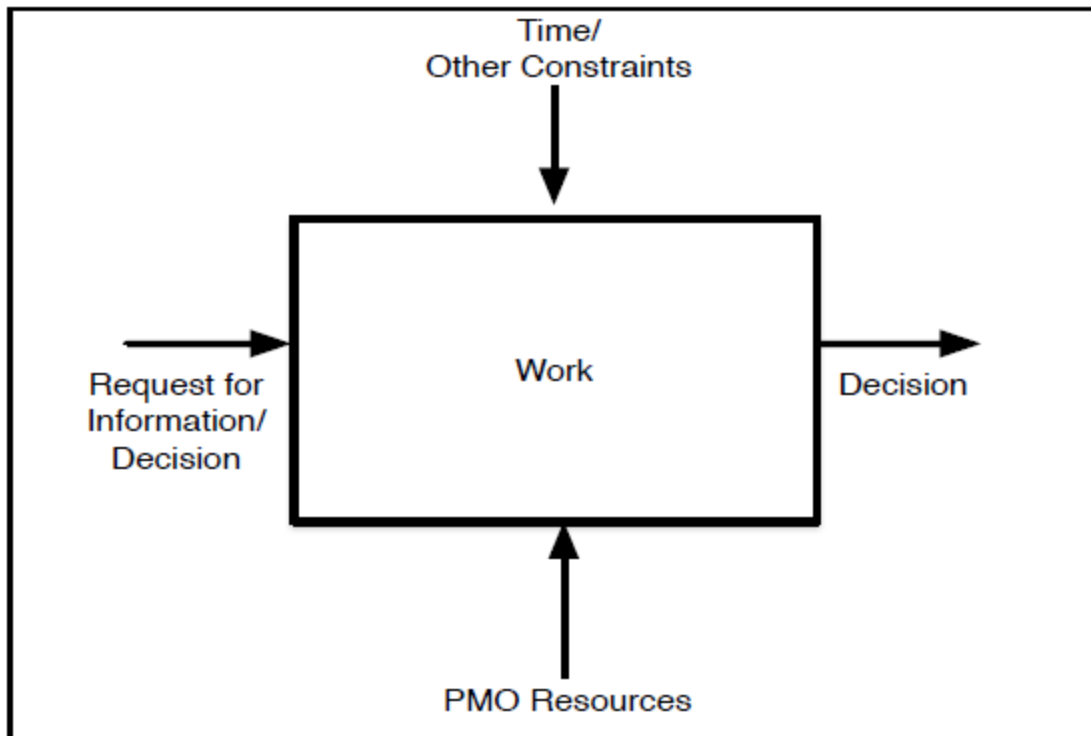


Figure 4. IDEF Applied to the PMO. Source: Pickar and Jones (2014).

Generating an IDEF0 model requires data collection that is often accomplished through direct observation of the process or interviews. However, since the scope of this effort defines specific Program Manager (PM) responsibilities, PM authorities, and stakeholder authorities based on existing DoD acquisition policies and Army regulations the data collection was limited to the source documents as researched and understood by the authors.

#### **4. Map the Acquisition Process from a PM Perspective to Work Elements of IFEF Framework**

In order to gain further insight into the data that was captured, our next step involved adding IDEF0 PMO process elements for “Work.” Additionally, we attempted to complete process category information for “Time/Other Constraints,” “Request for Information,” “PMO Resources” and “Decision.” Not every data element contained a specific “Work” process element. It was even more likely that each data element would

only contain a portion of the category information. However, the data aggregated together based on each work process element creates a more complete definition.

First, we identified the PM would be the focus of the study and translated the DoDI 5000.02 acquisition process to an IDEF0 framework. The model in Figure 5 represents the overview of our top-level node, A0 and the primary function of the PM. Furthermore, it illustrates how requirements and resources help PMs deliver capabilities.

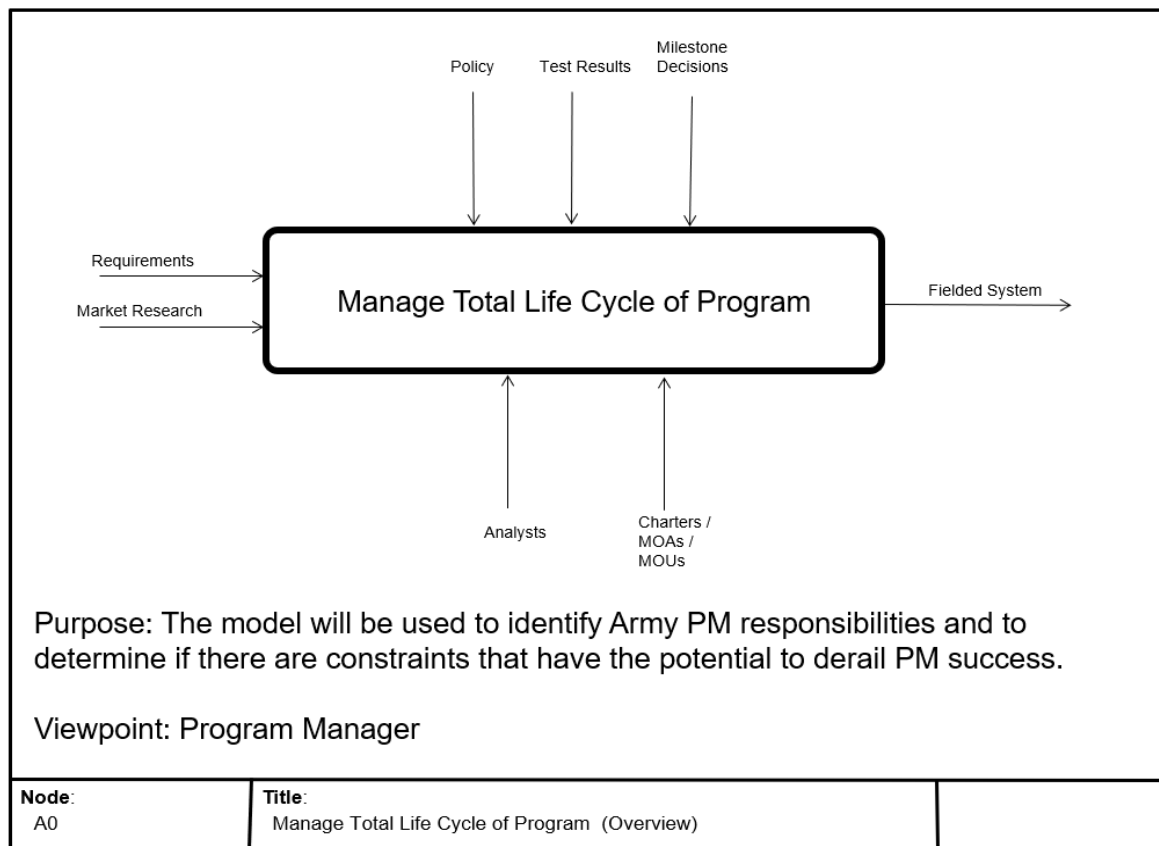


Figure 5. IDEF0 Model of Program Management Office Function  
(Node A0 – Overview)

A more detailed breakdown of node A0 demonstrated that the acquisition process can be cyclical for a PM in terms of the functions themselves, but also linear in that the PM must go through each acquisition phase to get a positive acquisition decision from the Milestone Decision Authority. We chose an iterative approach in our A0 chart that

incorporated the activities in each acquisition phase. We chose this over the linear process of completing each phase as a function in A0, because functions are repeated in each phase. The program starts with the Milestone Decision (Node A3), PM Plans (Node A2), and Executes (Node A3).

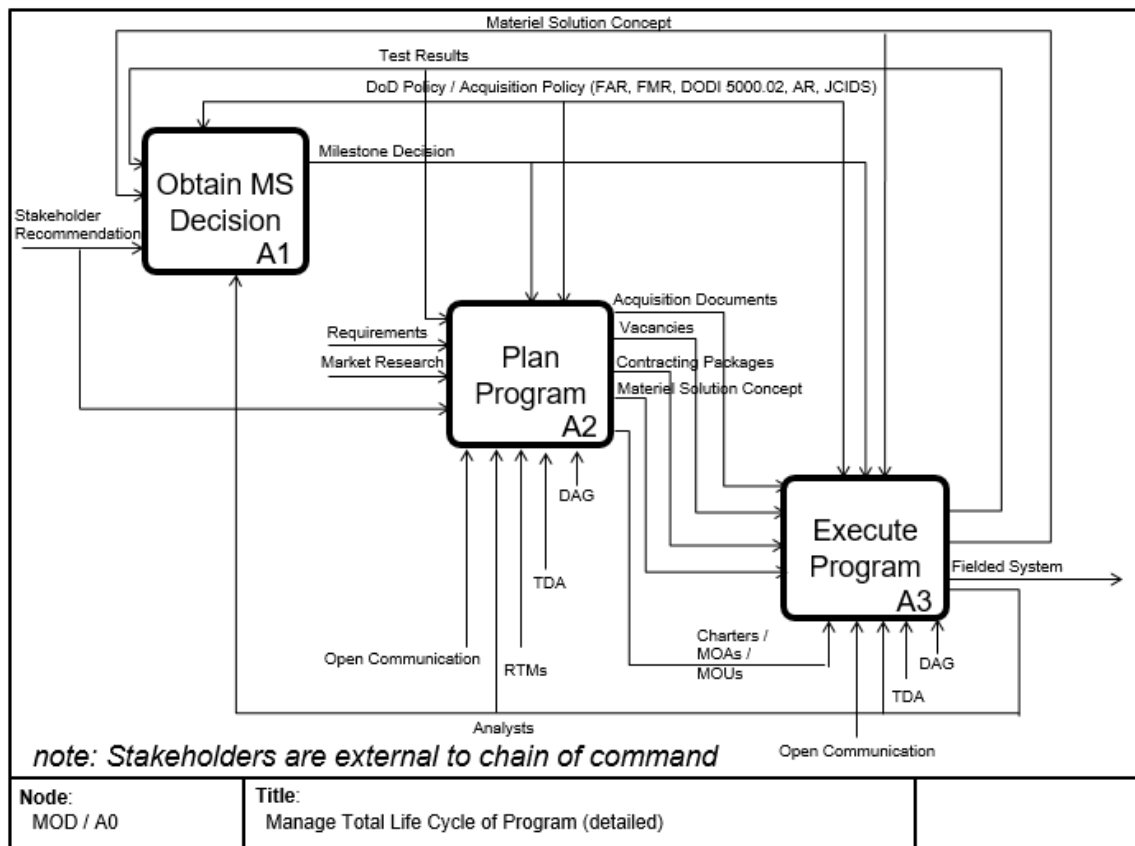


Figure 6. IDEF0 Model of PM Function (Node A0 – Detailed)

After we established the IDEF0 framework, we mapped the 82 work elements to the appropriate corresponding nodes identified in the acquisition process. Some work elements are depicted as functions, while others were more closely related to outputs. Table 3 shows the 931 instances of the aforementioned PM Work elements found in our source documents and how we mapped them to the corresponding node in our IDEF0 model.

Table 3. PM Work Elements and IDEF0 Mapping

| Node | Description                       | JCIDS<br>JAN15 | DoD5000.<br>02 | AR 1-1 | PAM 10-1 | AR 70-1 | New AR<br>70-1 | AR 73-1 | PAM 73-1 | AR 700-<br>08 | AR 700-<br>127 | AR 700-<br>142 | AR 702-<br>19 | FMR | Total |
|------|-----------------------------------|----------------|----------------|--------|----------|---------|----------------|---------|----------|---------------|----------------|----------------|---------------|-----|-------|
| A1   | Obtain Milestone Decision         | 0              | 10             | 0      | 0        | 9       | 1              | 0       | 1        | 0             | 4              | 33             | 0             | 0   | 58    |
| A2   | Plan Program                      | 1              | 170            | 0      | 1        | 174     | 36             | 2       | 8        | 0             | 126            | 22             | 6             | 9   | 555   |
| A3   | Execute Program                   | 0              | 54             | 0      | 1        | 51      | 40             | 17      | 10       | 0             | 51             | 71             | 6             | 17  | 318   |
| AO   | Summary                           | 1              | 234            | 0      | 2        | 234     | 77             | 19      | 19       | 0             | 181            | 126            | 12            | 26  | 931   |
| Node | Description                       | JCIDS<br>JAN15 | DoD5000.<br>02 | AR 1-1 | PAM 10-1 | AR 70-1 | New AR<br>70-1 | AR 73-1 | PAM 73-1 | AR 700-<br>08 | AR 700-<br>127 | AR 700-<br>142 | AR 702-<br>19 | FMR | Total |
| A1   | Plan Program                      | 0              | 5              | 0      | 0        | 0       | 21             | 0       | 3        | 0             | 1              | 0              | 0             | 6   | 36    |
| A2   | Execute Program                   | 0              | 0              | 0      | 0        | 0       | 0              | 0       | 0        | 0             | 0              | 0              | 0             | 0   | 0     |
| A3   | Obtain Milestone Decision         | 0              | 0              | 0      | 0        | 0       | 0              | 0       | 0        | 0             | 0              | 0              | 0             | 0   | 0     |
| A1-1 | Analyze Requirements              | 0              | 0              | 0      | 0        | 0       | 0              | 0       | 0        | 0             | 0              | 0              | 0             | 0   | 0     |
| A1-2 | Analyze Resources                 | 0              | 7              | 0      | 0        | 8       | 4              | 0       | 0        | 0             | 6              | 11             | 0             | 3   | 39    |
| A1-3 | Develop Acquisition Strategy      | 1              | 157            | 0      | 1        | 157     | 11             | 2       | 5        | 0             | 116            | 11             | 6             | 0   | 467   |
| A1-4 | Develop Contract Strategy         | 0              | 1              | 0      | 0        | 9       | 0              | 0       | 0        | 0             | 2              | 0              | 0             | 0   | 12    |
| A1-5 | Develop Stakeholder Strategy      | 0              | 0              | 0      | 0        | 0       | 0              | 0       | 0        | 0             | 1              | 0              | 0             | 0   | 1     |
| A2-1 | Manage Requirement                | 0              | 7              | 0      | 0        | 5       | 0              | 0       | 3        | 0             | 0              | 0              | 0             | 0   | 15    |
| A2-2 | Execute Resources                 | 0              | 1              | 0      | 0        | 7       | 0              | 4       | 0        | 0             | 7              | 1              | 0             | 11  | 31    |
| A2-3 | Execute Acquisition               | 0              | 39             | 0      | 1        | 38      | 14             | 4       | 3        | 0             | 39             | 67             | 5             | 4   | 214   |
| A2-4 | Manage Contract                   | 0              | 0              | 0      | 0        | 0       | 0              | 6       | 1        | 0             | 5              | 0              | 1             | 0   | 13    |
| A2-5 | Manage Stakeholders               | 0              | 7              | 0      | 0        | 1       | 26             | 3       | 3        | 0             | 0              | 3              | 0             | 2   | 49    |
| A3-1 | Recommend Streamlined Acquisition | 0              | 1              | 0      | 0        | 0       | 0              | 0       | 0        | 0             | 0              | 0              | 0             | 0   | 1     |
| A3-2 | Provide Milestone Documents       | 0              | 0              | 0      | 0        | 0       | 0              | 0       | 0        | 0             | 0              | 0              | 0             | 0   | 0     |
| A3-3 | Prepare MDA Staff                 | 0              | 0              | 0      | 0        | 0       | 0              | 0       | 0        | 0             | 0              | 0              | 0             | 0   | 0     |
| A3-4 | Conduct Milestone Review          | 0              | 9              | 0      | 0        | 9       | 1              | 0       | 1        | 0             | 4              | 33             | 0             | 0   | 57    |
| AO   | Summary                           | 1              | 234            | 0      | 2        | 234     | 77             | 19      | 19       | 0             | 181            | 126            | 12            | 26  | 931   |

In Table 2, work elements such as “Develop and execute LCSP” were only counted once in the metrics shown even though they were included in both planning (A2) and execution (A3) nodes. Each IDEF0 model we created is defined and explained in further detail in the following section.

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## **II. ANALYSIS OF IDEF0 MODELS AND WORK ELEMENT DATA**

The completion of the first four steps of our methodology has resulted in a data set of specific PM work elements that were then aligned with our IDEF0 mapping of the Army Acquisition processes. Now we can analyze the resulting IDEF0 models for the composite nodes. Then we can look at the results of the work element data itself to see if it provides any insights or suggestions for future reforms.

### **A. ANALYSIS OF IDEF0 MODELS AND OBSERVATIONS**

The base IDEF0 model in Figure 5 represents the overview of the primary function of the PM. The model in Figure 6 represents, based on review of the 5000.02, the iterative acquisition process wherein the PM plans, executes, and then requests a milestone decision for each phase of the program.

It is important to note that Figures 5 and 6 do not have an exhaustive representation of the inputs, outputs, controls, and mechanisms for each of the primary functions, A1 - A3, because of the need to portray the critical inputs to the Plan Program function from *this* viewpoint of *this* level of the model. Models for each of the process functions, A1 - A3, will follow with more comprehensive breakdowns of the inputs, outputs, constraints, and mechanisms.

#### **1. Manage Total Life Cycle of Program (Node A0)**

Table 4 shows the IDEF0 parameters (Input, Control, Mechanism, Output) for each work function node within A0.

Table 4. IDEF0 Analysis of Node A0 Composite Functions

| Node           | Input                                                                                                                                                                      | Control                                                                              | Mechanism                                                                                         | Output                                                                                                                                                                   |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A1             | <ul style="list-style-type: none"> <li>Requirements</li> <li>Market Research</li> </ul>                                                                                    | <ul style="list-style-type: none"> <li>Policy</li> <li>Milestone Decision</li> </ul> | <ul style="list-style-type: none"> <li>Analysts</li> </ul>                                        | <ul style="list-style-type: none"> <li>Acq. Documents</li> <li>Contracting Packages</li> <li>Materiel Solution Concept</li> <li>Charters</li> <li>MOAs / MOUs</li> </ul> |
| A2             | <ul style="list-style-type: none"> <li>Test Results</li> <li>Acq. Documents</li> <li>Contracting Packages</li> <li>Materiel Solution Concept</li> <li>Vacancies</li> </ul> | <ul style="list-style-type: none"> <li>Policy</li> <li>Milestone Decision</li> </ul> | <ul style="list-style-type: none"> <li>Analysts</li> <li>Charters</li> <li>MOAs / MOUs</li> </ul> | <ul style="list-style-type: none"> <li>Test Results</li> <li>Fielded System</li> <li>Materiel Solution</li> <li>Stakeholder Recommendation</li> <li>Analysts</li> </ul>  |
| A3             | <ul style="list-style-type: none"> <li>Acq. Documents</li> <li>Materiel Solution</li> <li>Stakeholder Recommendation</li> </ul>                                            | <ul style="list-style-type: none"> <li>Policy</li> <li>Milestone Decision</li> </ul> | <ul style="list-style-type: none"> <li>Analysts</li> </ul>                                        | <ul style="list-style-type: none"> <li>Milestone Decision</li> </ul>                                                                                                     |
| Node: MOD / A0 |                                                                                                                                                                            | Process: Manage Total Life Cycle of Program                                          |                                                                                                   | Date:                                                                                                                                                                    |

## 2. Plan Program (Node A2)

Node A2 is defined as the function to “Plan Program” and includes planning actions and documentation. Node A3 is execute program, the functions necessary to run a successful program. We’ve identified five key areas that mirror each other in planning and in execution. The planning and documentation functions will be in A2, and the execution and management functions will be in A3.

Figure 7 shows our IDEF0 model for A2. We see the first three functions mirror the key acquisition sections: requirements (A2-1), resources (A2-2), and acquisition (A2-3) work elements.

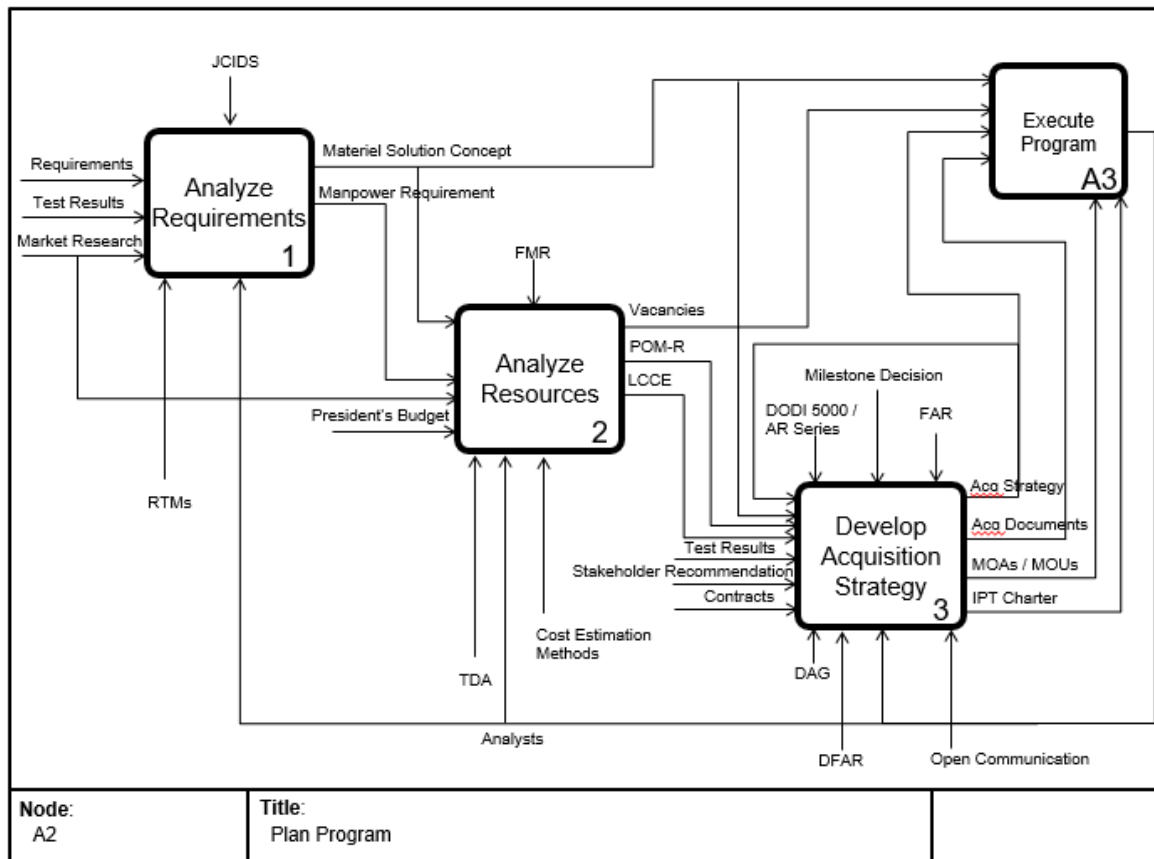


Figure 7. IDEF0 Model of PM Function (Node A2)

Table 5 shows the IDEF0 parameters (Inputs, Controls, Mechanisms, and Output) for each work function node within A1.

Table 5. IDEF0 Breakdown of Node A1 Composite Functions

| Node                                        | Input                                                                                                                | Control                                                                                                                                                     | Mechanism                                                                                                | Output                                                                                                                           |
|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| <b>A1-1</b><br>Analyze Reqs                 | <ul style="list-style-type: none"> <li>Requirements</li> <li>Test Results</li> <li>Market Research</li> </ul>        | <ul style="list-style-type: none"> <li>JCIDS</li> </ul>                                                                                                     | <ul style="list-style-type: none"> <li>RTMs</li> <li>Analysts</li> </ul>                                 | <ul style="list-style-type: none"> <li>Materiel Solution Concept (to A2)</li> <li>Manpower Requirements</li> </ul>               |
| <b>A1-2</b><br>Analyze Resources            | <ul style="list-style-type: none"> <li>Manpower Reqmts</li> <li>President's Budget</li> </ul>                        | <ul style="list-style-type: none"> <li>Materiel Solution Concept</li> <li>FMR</li> </ul>                                                                    | <ul style="list-style-type: none"> <li>TDA</li> <li>Analysts</li> <li>Cost Estimation Methods</li> </ul> | <ul style="list-style-type: none"> <li>Vacancies (to A2)</li> <li>POM-R</li> <li>LCCE</li> </ul>                                 |
| <b>A1-3</b><br>Develop Acq. Strategy        | <ul style="list-style-type: none"> <li>POM-R</li> <li>LCCE</li> <li>Materiel Solution Concept</li> </ul>             | <ul style="list-style-type: none"> <li>Market Research</li> <li>Acq Plan</li> <li>Milestone Decision</li> <li>DOD 5000 Series</li> <li>AR Series</li> </ul> | <ul style="list-style-type: none"> <li>DAG</li> <li>Analysts</li> </ul>                                  | <ul style="list-style-type: none"> <li>Acq Documents (to A2)</li> <li>Acq Strategy (to A2)</li> <li>Draft IPT Charter</li> </ul> |
| <b>A1-4</b><br>Develop Contracting Strategy | <ul style="list-style-type: none"> <li>Contracts</li> <li>Acq Strategy</li> <li>Materiel Solution Concept</li> </ul> | <ul style="list-style-type: none"> <li>FAR</li> </ul>                                                                                                       | <ul style="list-style-type: none"> <li>DFAR</li> <li>Analysts</li> </ul>                                 | <ul style="list-style-type: none"> <li>Acq Plan</li> </ul>                                                                       |
| <b>A1-5</b><br>Develop Stakeholder Strategy | <ul style="list-style-type: none"> <li>Draft IPT Charter</li> </ul>                                                  | <ul style="list-style-type: none"> <li>Stakeholders</li> </ul>                                                                                              | <ul style="list-style-type: none"> <li>Analysts</li> <li>Open Communication</li> </ul>                   | <ul style="list-style-type: none"> <li>IPT Charter (to A2)</li> <li>MOAs / MOUs (to A2)</li> </ul>                               |
|                                             |                                                                                                                      |                                                                                                                                                             |                                                                                                          |                                                                                                                                  |
| <b>Node:</b> A1                             | <b>Process:</b> Plan Program                                                                                         |                                                                                                                                                             |                                                                                                          | <b>Date:</b>                                                                                                                     |

The function “Managing Resources,” which includes obtaining and managing personnel, is a significant function of the PM. This was mentioned 11 times in the AR and 0 times in the DoDI 5000.02. Analysts were required for every function in this study, yet only 1% (11 / 931) of the work elements discussed managing and hiring personnel.

Fifty-two percent (483 out of 931) of the work elements focused on Milestone Acquisition Documents, which are identified as outputs in A1-3 (planning document) and A2-3 (executing the plan).

### 3. Execute Program (Node A3)

The IDEF0 model for the “Execute Program” function mirrors the three key planning areas in A2. The figure was not depicted due to the large similarities with A2.

While only 5% (46 / 931) of the work elements discussed interaction with stakeholders, a negative recommendation can result in not receiving your milestone decision. Stakeholders often influence additional documentation through requiring specific documentation or waivers to secure their support on an acquisition decision.

## **B. ANALYSIS OF RESULTS FOR WORK ELEMENTS DATA**

Our analysis identifies five key issues that make the PM role incredibly difficult to conduct successfully. These are

1. Authority and Synchronization with Requirements Organization
2. Authority and Synchronization with Contracting Organization
3. Development and Retention of Personnel
4. Stakeholder Influence and Implied Authority over Program Execution
5. Excessive Documentation Requirements

We will now look at each of these in more detail. The first three of these issues were identified by a significant lack of emphasis within the analyzed documents.

### **1. Authority and Synchronization with Requirements Organization**

JCIDs includes only one reference specifically to the program office manager, “a. A CIP breach review is a collaborative assessment by a risk mitigation team comprised of program office, capability Sponsor, capability developer, Functional Capability Board (FCB) representatives, and other applicable stakeholders” (Chairman of the Joint Chiefs of Staff, 2015, p. A-18).

Furthermore, this reference is specific only to a Critical Intelligence Parameter (CIP) breach review. Among the other documents reviewed, only another 14 mentions are made that assign responsibility to the PM to advise the requirement validation authority. Surely, there are other opportunities for the PM to provide value to the requirement development process.

The DoD and Army instructions and regulations we investigated establish a clear division of responsibility between combat developers, those responsible for generating requirements, and materiel developers, those PMs responsible for life cycle management: developing, procuring, fielding, and sustaining the materiel solutions that are needed. Practice indicates that such a clear division is a false one.

First, few requirements are completely new and the most current expertise often resides within the PM that has managed previous materiel solutions for the same or similar capability. This is acknowledged by multiple references such as DoDI 5000.02,

b. In support of the validation of the Capability Development Document (or equivalent requirements document), the Program Manager will conduct a systems engineering trade-off analysis showing how cost varies as a function of system requirements (including Key Performance Parameters), major design parameters, and schedule. The results will be provided to the MDA and will identify major affordability drivers and show how the program meets affordability constraints. (Department of Defense, 2015, p. 82)

A better solution would be if the PM and capability developers worked together from the very beginning to ensure the best product for the Warfighter. However, the PM is often officially told that requirements development is not his responsibility, and therefore he should only develop solutions based on documented requirements. Such an attitude assumes that the combat developer has all the expertise to fully develop the requirement.

Furthermore, the structural divide established by current regulation and instruction established Capability Development and Integration Divisions (CDIDs) as the single parent of every program. They “birth” the program alone and the PM is often perceived as the bad parent that is not taking good enough care. Each combat developer often conducts his own, entirely independent, market research with vendors going directly to leadership proposing solutions or via industry day events such as the Fort Benning Expo held September 12–14, 2017. This is an important tool for the combat developer to gain or maintain expertise in their functional area.

The JCIDS’ process does not direct the capability developer to conduct independent market research. It recommends working with the sponsor (PM) and Integrated Process

Teams (including the PM). Due to geographical and organizational separations, PMs may not be intimately involved as a partner, and combat developers become frustrated by the amazing “demonstrated” capabilities presented by Industry. Capability developers then perceive that the acquisition office is unwilling or unable to give them these capabilities, while not fully understanding the acquisition and contracting policies.

Combat developers are not subject to the DAWIA certification process that helps to ensure that acquisition professionals are properly trained. Thus, an adversarial relationship is quickly established. They are also frustrated because they officially control only the requirement, yet they can have one of the most significant impacts on the budgeting process. In fact, because the Army's current budgeting process prioritizes programs with a documented requirement, their authority to develop requirements is also an authority to begin or delay the budget process for materiel solutions.

The PM is in a tug-of-war, does not have the authority or “gas pedal,” but is perversely responsible to get “the bus to the final destination on time” (Shyu, 2015). This is often a billion-dollar game of chicken, where funds are aligned for the next phase of the program, but a requirement document may be preventing the program from achieving that milestone. Since the capability developer is not responsible to the MDA, there are no repercussions if they delay under the premise of getting the best capability to the Warfighter. Both the capability developer and PM would benefit by working more closely together so they can ultimately support the Warfighter.

Industry approaches the acquisition process differently. Their acquisition triangle is still PM, financial managers, and capability developers, or in this case business developers and marketing teams. When there are decisions to be made, they all report to one person in charge, the chief executive officer (CEO). Success is measured based on how many customers purchase products/services and the profit achieved by the company from these sales. All members of a corporate team are inherently engaged and motivated to ensure team success because product success is truly life or death of the company. While in the DoD, the only person with a schedule to manage is the PM, and each part of the acquisition process have their own CEOs, aka flag officers, so no one person manages this process.

Combat developers can only write requirements and PMs can only execute what they are given. When PMs fail to get it right, they most often point to changing or impossible requirements. Something else is needed to provide the inherent motivation that exists in Industry. An approach would be to embed those doing the requirement development work within the PMO. This would be straightforward since PEOs are already closely aligned with specific Centers of Excellence. As the ultimate customer for materiel solutions, the Centers of Excellence would remain in control by approving (validating) only those requirements they desired and supporting funding only for those materiel solutions that meet a need. The greater control of the requirement development process, in turn, inherently motivates the PM to get it right from the beginning and removes any ambiguity regarding whose responsibility it is. The same basic team that generates the requirement can immediately begin execution with minimal misunderstanding or misinterpretation. PMs would greatly benefit from a more efficient process to make final decisions on requirements, regardless of whether it rests within the PM or functional community. This will prevent stalemates that happen on a regular basis. Keeping the authority to approve and fund program requirements external to the PM, provides the appropriate check and balance and motivation to get it right, but adds program schedule. If the PM is ultimately held responsible for the lack of, or for poor requirements, they should be given greater influence in the derivation of functional requirements to technical requirements. As long as there are two chains of command for requirements and the PM, there will continue to be a duality and stalemate that will delay programs. We recommend further research on a better method to ensure the Warfighter receives the right solutions, while ensuring PMs do not have another steering wheel on the bus.

## **2. Authority and Synchronization with Contracting Organization**

Similar to requirement development, a PM does not have any authority in the area of contracting. Only contracting officers within contracting commands, who are “warranted,” may enter the Government into a contract. The contracting officers work within the Army contracting commands that are part of AMC and are distributed regionally across the country. The documents we reviewed have little to say about contracting with

only two references to the work element “develop and manage contract” and 12 references to “develop and execute Acquisition Plan (AP)” identified.

This lack of focus on contracting is astounding, since PMs are highly dependent on work performed by Systems Engineering and Technical Assistance (SETA) contractors and Industry to accomplish most of the work developing and manufacturing materiel solutions. Perhaps this lack of mention in the documents we reviewed is explained by the extensive documentation for contracting in the Federal Acquisition Regulations (FAR) and corresponding Defense (DFAR) and Army (AFAR) documents. However, a quick word check of these documents further reinforces our original finding with only 39 mentions of PM, and its synonyms in more than 2,000 pages of regulation (8 in FAR, 22 in DFAR, and 9 in AFAR).

The lack of emphasis on contracting within the regulations may reflect a more general attitude of contracting as an afterthought, and this is in spite of the criticality of contracts to accomplish the work of the PM. The Army Contracting Command (ACC) Program Acquisition Lead Time (PALT) baseline measurements for the recommended full and open competition of contracts over \$50M is 600 days or greater and this measurement specifies that measurement only starts “when the acquisition planning documents are complete and the primary responsibility for further action rests with the contracting office” (Simpson, 2017, p. 2). While in execution these timelines may be shorter, decisions involving level of review and the timeline for that review can be arbitrary or based on the contracting review official’s personal preference. This lack of predictability can add additional uncertainty to program schedules and frustrate the relationship between the PM and the contracting organization.

Army Contracting offices are guided by the FAR, DFAR and AFAR, and their work is driven primarily with compliance with these documents. Furthermore, the responsibilities identified in the documents we reviewed are also focused on compliance rather than results. Like the requirements development issue, an immediate solution to improve contracting is to more closely align the contracting officers and their supporting functions (particularly legal) within a PEO’s chain of command. If the PM is ultimately held responsible for poor contracts, they should be given greater influence on contract

direction. If there are two chains of command for contracting and PM, there will continue to be a duality and stalemate that will delay programs. We recommend further research on a better method to ensure the Warfighter receives the right solutions, while ensuring PMs do not have another steering wheel on the bus.

### **3. Development and Retention of Personnel**

The current chief of staff of the Army, General Mark A. Milley, includes people in his top three priorities (Weisberger, 2015), yet there are only seven references out of 931 (0.8%) associated with the work element “Obtain personnel resources” among the documents we researched. The first reference in AR 70–1 refers simply to “Develop and submit requirements for financial, manpower, matrix, and contractor support to the AAE through the respective PEO or DRPM” (Department of the Army, 2011, p. 8). The other AR 70–1 reference is specific to program restarts and directs the PM to work with USAASC to “document required program office staffing” (p. 33). The remaining seven references are all contained in AR 700–127 and are entirely focused on one specific position within Army Acquisition, that of Product Support Manager (PSM). Therefore, the Army’s body of acquisition regulations almost entirely ignore addressing a PM’s responsibility and/or authorities to obtain the necessary personnel resources.

It does so at the same time that it micromanages one specific position, that of the PSM, to be allocated and filled before MS B, assigned by the PEO, and even to specify the requirement that PEOs and MATDEVs (PMs) are required to “ensure that PSMs continue their professional development to include program management, contracting, and business-financial management Defense Acquisition Workforce Improvement Act training” (Department of the Army, 2016, p. 13). Such detailed policy requirements around a specific acquisition position are clearly micromanaging.

Similar to the previous contracting discussion, the issue that this absence of personnel focus establishes for the PM is one of negligence and afterthought. What responsibility and/or authority does a PM have to build and maintain a strong team? From the documentation we have reviewed, it would appear that it can be summed up in the

statement, “Tell us who you need, and live with what you get...and make sure you have a PSM.” This is incredibly cynical, but too often hits home as the reality of a PM’s world.

DoD and Army personnel practices are extremely cumbersome and time consuming on the front end. One of our authors had the personal experiences of spending months working to post and then review resumes, interview, and make a hiring decision, only to be informed that the individual would not accept the position because the Army would not pay relocation costs. The Army would not pay these costs simply because the initial position description did not include mention of this possibility though funding resources were available.

In a single, shortsighted policy decision, additional offices like CPAC were able to determine the composition and timelines. This is a clear example where, in practice, the PM does not have the necessary authority to manage his personnel as needed to successfully execute the miss. If the PM is ultimately held responsible for the program personnel, they should be given greater influence on the hiring process. This would add little risk to the Warfighter. As long as there are two chains of command for hiring personnel, there will continue to be a duality and stalemate that will delay programs, adding another steering wheel on the bus.

#### **4. Stakeholder Influence and Implied Authority over Program Execution**

Authority outside the acquisition chain of command exists most clearly in the areas of logistics and testing with the conflict being the authorities provided to the Army Materiel Command (AMC) and Army Evaluation Command (AEC) over program decisions.

The logistics and test and evaluation organizations in the DoD have authority for their functional areas, while the PM has ultimate responsibility for all aspects of a program. Going back to the previous bus analogy, these stakeholders have two of the most sensitive brake pedals. The primary PM documents that these two stakeholders influence are the Life Cycle Sustainment Plan (LCSP) and the Test and Evaluation Master Plan (TEMP). Across 13 key acquisition documents reviewed there were 154 instances in which PMs were directly tasked to develop and manage the LCSP, and 70 instances directing the

development of the TEMP. While the primary stakeholders are involved in the development of these documents, it is ultimately the PM's responsibility to ensure that each document captures all of the necessary information for a complete sustainment effort and test and evaluation plan, respectively.

AR 70-1 gives AMC responsibility over sustainment funding, "d. Support PEOs and PMs by overseeing the USAMC life cycle management commands' development and submission of sustainment funding requirements during the Army's planning, programming, budgeting and execution system activities" (Department of the Army, 2011, p. 21). Unfortunately, the same responsibility is assigned to the CAPDEV and PM by AR 700-127,

#### 8-14. Resource planning

1. The CAPDEV and MATDEV will ensure that costs and resource requirements for IPS execution are planned, programmed, budgeted, funded, and monitored throughout the acquisition program life cycle.
2. The CAPDEV and MATDEV will establish IPS program objectives that support the reduction of O&S cost.
3. The CAPDEV and MATDEV will prepare, submit and defend IPS resource requirements through the programming, budgeting and execution system process. (Department of the Army, 2016, p. 31)

PMs typically have input into AMC's PPBE process but no authority to change AMC priorities and therefore sustainment funding allotments to individual programs are controlled by AMC. The PM may be responsible for the entire life cycle of a program, but money is power, and AMC can directly change the course of a program's sustainment execution since it controls the purse strings. This AMC control of funding generates a clear duplication of authority and prevents the MDA and his PM from being in full control of a program's total life cycle. Instead, sustainment funding for each program should be submitted into the Army's PPBE process by the PM along with the rest of a program's life cycle funding (RDTE and PROC), received by the responsible PM if allocated by the Army, and subsequently provided to the responsible LCMC.

Another duplication of authority associated with AMC comes from AR 700-142, Type Classification, Materiel Release, Fielding and Transfer. This regulation directly

assigns Materiel Release authority to, “The appropriate AMC LCMCs or other supporting command” (Department of the Army, 2015, p. 7). PMs are not permitted to field a system to Soldiers until a materiel release is approved and therefore the MDA’s authority over his program is duplicated, and really usurped, as the MDA must obtain approval from his AMC counterpart.

However, this requirement for materiel release does not come from DoDI 5000.02. In fact, it is counter to an MDA authority stated by DoDI 5000.02 as

The MDA, in consultation with the supporting operational test organization, and with the concurrence of DOT&E for programs on DOT&E oversight, will determine:

1. Whether the capability has been adequately reviewed, performs satisfactorily, is supportable, and is ready for production and deployment.
2. When assessments of fielded capabilities are required.

(c) The MDA decides whether to produce and, in coordination with the requester/user, deploy (field) the system. (Department of Defense, 2015, p. 167)

The Army’s Materiel Release process is established by AR 70–1 and is meant to independently verify that a system is safe, suitable and supportable prior to fielding. By assigning MR authority to AMC LCMCs, the Army duplicates responsibilities directly assigned to the PM by DoDI 5000.02.

Additionally, DoDI 5000.02 states

Prior to exposing people, equipment, or the environment to known system-related ESOH hazards, the Program Manager will document that the associated risks have been accepted by the following acceptance authorities: the CAE for high risks, Program Executive Officer -level for serious risks, and the Program Manager for medium and low risks. The user representative, as defined in MIL-STD-882E, must be part of this process throughout the life cycle and will provide formal concurrence prior to all serious- and high-risk acceptance decisions. (Department of Defense, 2015, p. 100)

There is no mention of an independent authority separate from the PM’s direct chain of command. Moreover, to document that safety compliance has been achieved, the

PM obtains a safety certification from the responsible safety office. This office is already independent from the PM chain of command and therefore the materiel release process generates additional duplication of authority as multiple parties within AMC each question and assess the safety of the system.

The duplicate authority and inherent problem with the current materiel release process can be corrected by simply returning the approval authority to the MDA. Independent review would still be achieved by the Army MR process since the three primary inputs to the process would remain with AMC. These are the safety certification, the suitability certification, and the supportability certification that are provided by the responsible safety office, AEC and responsible LCMC, respectively. With this change, the MDA would be capable of making the decision to field a new system directly and in consultation with the system's user, and as intended by DoDI 5000.02.

Duplication of authority associated with testing is not as overt as with logistics. AEC does not plan, program, budget, or execute funding for specific programs as is the case with AMC, nor has AEC been assigned program decision making authority like what AMC has been assigned in the materiel release process. The MDA has clear authority to approve the program TEMP, and the test community's evaluation of a program, even if it includes a negative opinion of the system's performance, is simply input and not a program decision. Instead, the test community obtains authority over a program indirectly based on its responsibility to provide the independent assessment.

In particular, the Director Operational Test and Evaluation (DOT&E) is granted unlimited ability to impact programs by having complete discretion over selecting the programs it will oversee. Furthermore, DOT&E is granted authority over the test quantity of LRIP systems. Both of these authorities can significantly increase the cost and schedule of a program and can do so to such an extent that test agency decisions undermine a program. There is no existing check and balance to counter this DOT&E authority. Additionally, after the TEMP is approved the detailed test plans developed to support agreed upon testing often expand beyond the intended scope necessary to address the requirement and seek to test undocumented requirements.

There are multiple reasons for this, to include the Way We've Always Done It effect, overreaching test directors, test agencies looking for additional work, etc. Since acquisition programs exist to provide capability to the Warfighter as represented by a Requirement Developer, an obvious check on the test communities' authority would be to require the user's concurrence with the T&E position. Unfortunately, such a check is not included in current processes and policy documents fail to include the user in several key areas of the test process.

In addition, these Army Regulations are sponsored by the organizations that directly dictate what a PM needs to complete for them. This is, arguably, outside their authority. If the PM is ultimately held responsible for the program, we should limit regulations that add work but provide limited value to the Warfighter. As long as there continues to be multiple chains of command, there will continue to be a multiplicity or stalemate that will delay programs. We recommend further research on a better method to ensure the Warfighter receives the right solutions, while ensuring PMs do not have to deal with additional steering wheels on the bus.

## **5. Excessive Documentation Requirements**

Our document analysis also identifies a significant emphasis on compliance to specific and voluminous documentation requirements. Despite attempts at reform, a common PM complaint continues to be that there is too much documentation. From a pure, process perspective as identified by the overall IDEF0, it would seem that the underlying process framework is reasonable. This means that PMs may be responsible for a significant amount of program cost increase, delay and performance failure simply due to poor planning and execution of the acquisition processes.

Throughout our analysis, the idea that the PM should generate additional documentation to facilitate program movement through the stakeholder review process was a common theme. We found in our review that 52% of the work elements identified (483 / 931) were where PMs were directly tasked with developing documentation to support Milestone Decision Reviews. Instead of the subject matter experts that reside within each stakeholder's organization conducting an analysis of readily available program data, the

PM must instead produce and staff documentation that addresses all possible stakeholder concerns. These concerns must be formally addressed, regardless of how obvious their lack of applicability may be. The result is hours spent developing documentation that provides no benefit to the PM, the stakeholder, or the Milestone Decision Authority (GAO, 2015).

The time required to accomplish this is further increased by the levels of review required within the stakeholder's own organization (GAO, 2015). Inflated timelines are not a problem that is perpetuated exclusively by the stakeholders themselves, but also by the Milestone Decision Authority. The MDAs, or more specifically their staffs, base their review of the PM's staffing packages on standard checklists that are rarely tailored to fit a particular program. The desire to address every existing requirement instead of the requirements that can be associated logically with each program leads to unnecessary document development and staffing, along with excessive stakeholder coordination.

If the MDA's role is to ensure that a program is ready to enter the next phase of the acquisition life cycle, then why shouldn't the documentation, provided in the form of milestone packages, be tailored to address the specific concerns of the MDA? Throughout the DoDI 5000.02, the MDA is empowered to make tailoring decisions on the future of an Army program, and determine the most efficient way to address their own concerns. However, in execution, these tailoring efforts are hampered by inflexible organizations and bureaucracy. This change to regulation is a step in the right direction, but there is no forcing function or organizational incentive for implementation.

The current balance between risk reduction and program efficiency leans predominantly toward risk reduction. PM offices, although directed by regulation to streamline, are not empowered to tailor their programs to achieve efficiency. The tailoring allowed to date has often taken the form of allowing the PM to apply for waivers from individual stakeholders. These waivers themselves require development and staffing time and are more often than not rejected by the stakeholder (GAO, 2015). Our IDEF0 model also identifies where stakeholders have a key input into the MDA's decision and have signature authority on acquisition documents. This has been documented in Army regulations, for better or for worse, adding additional steering wheels to the PM's bus.

In the end, the PM is held responsible for delays due to changes or additions driven by input from individual stakeholders, while those stakeholders face no consequences for delaying program progress (GAO, 2015). As the U.S. military struggles to maintain capability overmatch among near peer potential rivals, these inefficient processes make achieving that goal more difficult over time.

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### **III. RECOMMENDATIONS, FUTURE WORK, AND CONCLUSION**

Our data collection and subsequent IDEF0 analysis revealed five key issues with the acquisition process as documented in current DoD and Army regulations:

1. Authority and Synchronization with Requirements Organization
2. Authority and Synchronization with Contracting Organization
3. Development and Retention of Personnel
4. Stakeholder Influence and Implied Authority over Program Execution
5. Excessive Documentation Requirements

DoDI 5000.02 and many Army regulations state that the PM is responsible for the full life cycle of their program. However, what all five of these issues have in common is that they result from the reality that the PM does not have the authority necessary to fulfill this significant responsibility. Furthermore, even the PM's direct chain of command cannot fully provide this authority since current regulations spread the authority across numerous stakeholders and in some cases, even duplicate it across multiple chains of command—TRADOC for requirements, AMC for contracting and logistics, and Installation Management Command for Personnel. Even the finding of excessive documentation requirements results from this same source. While the latest DoDI 5000.02 emphasizes the need for MDAs and their PMs to tailor and streamline the acquisition process, the current distribution of authority requires buy in from too many stakeholders resulting in a collection by the PM of "waivers" that result in the status quo and lengthy documentation process being the easier path to follow.

#### **A. RECOMMENDATIONS**

Along with responsibility for the entire life cycle of a PM's program, the PM must be given greater and clearer authority. This can only be accomplished through a significant reorganization of the current Army acquisition structure and an emphasis on focused

stakeholder responsibility and accountability. Fortunately, the current Army leadership has recently begun setting the necessary conditions for exactly this sort of reform.

The Army began this process in October 2017 by issuing a memorandum establishing six modernization priorities and acknowledging that current structures and processes need to be substantially improved. This memo was followed by three additional memorandums that provided progressively greater implementation details, particularly for the Cross-Functional Teams (CFTs) that will be used as the means to achieve the modernization goals more effectively. Key to this implementation is a phrase from the first memo, “To implement the necessary changes, our Army will establish unity of command and unity of effort that consolidates the modernization process under one roof” (Milley and McCarthy, 2017, para. 13). Army leadership has also begun holding stakeholders to the acquisition process accountable through the issuance of seven directives encompassing eight specific initiatives. We are encouraged that many of these seek to address the issues we have identified including:

Initiative 1: STREAMLINING THE DEVELOPMENT AND APPROVAL OF CAPABILITY REQUIREMENTS

Initiative 2: IMPROVING TALENT MANAGEMENT

Initiative 4: STREAMLINING TEST AND EVALUATION AND MINIMIZING REDUNDANT TESTING

Initiative 6: STREAMLINING THE CONTRACTING PROCESS

Initiative 8: ASSESSING PERFORMANCE WITH METRICS

Our five key issues correlate fairly well with the initiatives listed above. Issue #1: Authority and Synchronization with Requirements Organization correlates with Initiative #1. Issue #2 Authority and Synchronization with Contracting Organization correlates with Initiative #4. Issue #3 Development and Retention of Personnel correlates with Initiative #2. Issue #4 Stakeholder Influence and Implied Authority over Program Execution correlates to Initiative #4 and #8. And Issue #5 Excessive Documentation Requirements was not discussed in this memo, but the 2015 GAO report discusses it thoroughly.

The issues we have identified are all likely to be resolved if Army leadership continues its aggressive reform of Army acquisition and follows through on the commitment to provide the Army acquisition process with unity of command.

## **B. FUTURE WORK**

We recommend the following possible studies to delve deeper into how Army PMs can better accomplish their task of bringing materiel solutions to the Warfighter.

1. A study to recommend streamlining the DoDI 5000.02 with a focus on fielding systems to the Warfighter versus the current focus which is to develop milestone documents (68%, 160 of the 234 work functions in DoDI 5000.02).
2. A study to recommend rewrites of existing Army regulation to support fielding systems to the Warfighter versus direction from stakeholders to meet certain objectives for stakeholders that may or may not support the Warfighter.
3. A study to analyze emerging acquisition reforms: Future Modernization Command (FMC) and Cross Functional Teams (CFTs) guidance.
4. A study to determine specific industry program management and stakeholder roles and responsibilities. This would differ than previous studies that usually add additional regulations that add responsibilities and work but add limited value to the Warfighter.

## **C. CONCLUSION**

The analysis of our 13 key documents identified many areas where the PM is required to request permission from stakeholders, through waivers or signatures on key documents, in order to move the program forward. Stakeholders may also sponsor additional regulations on an annual basis. In addition, our IDEF0 models identify that stakeholders have significant ability to influence the acquisition process. In the case of our

CEO counterparts in industry, there is one person in charge that can fully direct their programs. In the Army, we have multiple stakeholders fighting for control of the bus.

We recommend the MDA have full control of the programs and have much stronger ability to guide the program. It may add risk to the Warfighter, but ultimately, it should streamline and save the government billions of dollars. As long as there are multiple chains of command for simple disagreements, there will continue to be stalemates that will delay programs. If we continue with our current method, we will have more stakeholders and more steering wheels to add to the bus.

## APPENDIX A. PROJECT DATA SET

| ID            | WORK ELEMENT                              | IDEF     | Element                          | A0 | AX | JCIDS JAN15 | DoD5000 | AR | PAM 1 | AR 7 | NEW AR 7 | AR 73 | PAM 73 | AR 700 | AR 700-1 | AR 700-1 | AR 702 | FI | TOTAL |
|---------------|-------------------------------------------|----------|----------------------------------|----|----|-------------|---------|----|-------|------|----------|-------|--------|--------|----------|----------|--------|----|-------|
|               | 1 Develop and support POM Budgets         | Output   | POM-R                            | A1 | 2  | 0           | 1       | 0  | 0     | 5    | 0        | 0     | 0      | 0      | 3        | 2        | 0      | 3  | 14    |
|               | 2 Exercise fund-control responsibility    | Function | Execute Resources                | A2 | 2  | 0           | 1       | 0  | 0     | 1    | 0        | 0     | 0      | 0      | 0        | 0        | 0      | 11 | 13    |
|               | 3 Develop and maintain POE                | Output   | LCCE                             | A1 | 2  | 0           | 2       | 0  | 0     | 2    | 3        | 0     | 0      | 0      | 1        | 0        | 0      | 0  | 8     |
|               | 4 Fund testing                            | Function | Execute Resources                | A2 | 2  | 0           | 0       | 0  | 0     | 3    | 0        | 4     | 0      | 0      | 0        | 0        | 0      | 0  | 7     |
|               | 5 Develop and execute LCSP                | Output   | Acq Docs                         | A1 | 3  | 0           | 30      | 0  | 0     | 37   | 6        | 0     | 0      | 0      | 75       | 6        | 0      | 0  | 154   |
| 5B            | Develop and execute LCSP                  | Output   | Cont Reqt                        | A2 | 3  |             |         |    |       |      |          |       |        |        |          |          |        |    |       |
|               | 6 Develop and execute TDS / SEP           | Output   | Acq Docs                         | A1 | 3  | 1           | 40      | 0  | 0     | 75   | 2        | 0     | 0      | 0      | 20       | 3        | 0      | 0  | 141   |
| 6B            | Develop and execute TDS / SEP             | Output   | Cont Reqt                        | A2 | 3  |             |         |    |       |      |          |       |        |        |          |          |        |    |       |
|               | 7 Develop and execute AS                  | Output   | Acq Strat                        | A1 | 3  | 0           | 32      | 0  | 1     | 27   | 2        | 0     | 0      | 0      | 9        | 0        | 0      | 0  | 71    |
| 7B            | Develop and execute AS                    | Output   | Cont Reqt                        | A2 | 3  |             |         |    |       |      |          |       |        |        |          |          |        |    |       |
|               | 8 Develop and execute TEMP                | Output   | Acq Docs                         | A1 | 3  | 0           | 47      | 0  | 0     | 11   | 0        | 1     | 4      | 0      | 4        | 2        | 1      | 0  | 70    |
| 8B            | Develop and execute TEMP                  | Output   | Cont Reqt                        | A2 | 3  |             |         |    |       |      |          |       |        |        |          |          |        |    |       |
|               | 9 Develop and monitor APB                 | Output   | Acq Docs                         | A1 | 3  | 0           | 6       | 0  | 0     | 7    | 0        | 0     | 0      | 0      | 1        | 0        | 0      | 0  | 14    |
| 9B            | Develop and monitor APB                   | Output   | Cont Reqt                        | A2 | 3  |             |         |    |       |      |          |       |        |        |          |          |        |    |       |
|               | 10 Develop and execute AP                 | Output   | Acq Plan                         | A1 | 4  | 0           | 1       | 0  | 0     | 9    | 0        | 0     | 0      | 0      | 2        | 0        | 0      | 0  | 12    |
| 10B           | Develop and execute AP                    | Output   | CDRL                             | A2 | 4  |             |         |    |       |      |          |       |        |        |          |          |        |    |       |
|               | 11 Develop and maintain LCCE              | Output   | LCCE                             | A1 | 2  | 0           | 0       | 0  | 0     | 1    | 1        | 0     | 0      | 0      | 0        | 9        | 0      | 0  | 11    |
|               | 12 Report CCA compliance                  | Function | Execute Acquisition              | A2 | 3  | 0           | 1       | 0  | 0     | 3    | 1        | 0     | 0      | 0      | 0        | 0        | 0      | 0  | 5     |
|               | 13 Develop and implement CARD             | Output   | LCCE                             | A1 | 2  | 0           | 3       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 1        | 0        | 0      | 0  | 4     |
|               | 14 Comply with policy                     | Control  | Policy                           | A1 |    | 0           | 5       | 0  | 0     | 0    | 21       | 0     | 3      | 0      | 1        | 0        | 0      | 6  | 36    |
| 14B           | Comply with policy                        | Control  | Policy                           | A2 |    |             |         |    |       |      |          |       |        |        |          |          |        |    |       |
| 14C           | Comply with policy                        | Control  | Policy                           | A3 |    |             |         |    |       |      |          |       |        |        |          |          |        |    |       |
|               | 15 Propose cost reductions                | Function | Plan Resources                   | A1 | 2  | 0           | 1       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 1        | 0        | 0      | 0  | 2     |
|               | 16 Provide corrective actions             | Function | Execute Acquisition              | A2 | 3  | 0           | 0       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 0        | 0        | 2      | 0  | 2     |
|               | 17 Prepare programs for decisions         | Function | Recommend Streamline Acquisition | A3 | 1  | 0           | 1       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 0        | 0        | 0      | 0  | 1     |
|               | 18 Field systems                          | Output   | Fielded System                   | A2 | 3  | 0           | 1       | 0  | 0     | 1    | 0        | 0     | 0      | 0      | 2        | 45       | 0      | 0  | 49    |
|               | 19 Conduct Logistics Demonstration        | Output   | Sustainment                      | A2 | 3  | 0           | 0       | 0  | 0     | 0    | 0        | 1     | 0      | 0      | 10       | 0        | 0      | 0  | 11    |
|               | Supply Basis of Issue Plan Feeder         |          |                                  |    |    |             |         |    |       |      |          |       |        |        |          |          |        |    |       |
| 20 Data       |                                           | Output   | Sustainment                      | A2 | 3  | 0           | 0       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 7        | 1        | 0      | 0  | 8     |
|               | 21 Conduct Core Depot Assessment          | Output   | Sustainment                      | A2 | 3  | 0           | 1       | 0  | 0     | 5    | 0        | 0     | 0      | 0      | 1        | 0        | 0      | 0  | 7     |
|               | 22 Control and account for property       | Output   | Sustainment                      | A2 | 3  | 0           | 0       | 0  | 0     | 0    | 1        | 0     | 0      | 0      | 0        | 6        | 0      | 0  | 7     |
|               | 23 Chair PSM IPT                          | Function | Manage Stakeholders              | A2 | 4  | 0           | 0       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 4        | 0        | 0      | 0  | 4     |
|               | Conduct Integrated Product Support        |          |                                  |    |    |             |         |    |       |      |          |       |        |        |          |          |        |    |       |
| 24 Analysis   |                                           | Output   | Sustainment                      | A2 | 3  | 0           | 0       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 4        | 0        | 0      | 0  | 4     |
|               | 25 Develop and conduct training           | Output   | Sustainment                      | A2 | 3  | 0           | 0       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 1        | 3        | 0      | 0  | 4     |
|               | 26 Obtain Safety Confirmation             | Output   | Sustainment                      | A2 | 3  | 0           | 0       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 0        | 4        | 0      | 0  | 4     |
|               | Obtain transportability and deployability |          |                                  |    |    |             |         |    |       |      |          |       |        |        |          |          |        |    |       |
| 27 assessment |                                           | Output   | Sustainment                      | A2 | 3  | 0           | 0       | 0  | 0     | 1    | 1        | 0     | 0      | 0      | 0        | 2        | 0      | 0  | 4     |
|               | 28 Leverage or Develop and Field TMDE     | Output   | Sustainment                      | A2 | 3  | 0           | 0       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 0        | 2        | 0      | 0  | 2     |

| ID | WORK ELEMENT                                        | IDEF     | Element                     | A0 | AX | JCIDS JAN15 | DoD5000 | AR | PAM 1 | AR 7 | NEW AR 7 | AR 73 | PAM 73 | AR 700 | AR 700-1 | AR 700-1 | AR 702 | FI | TOTAL |
|----|-----------------------------------------------------|----------|-----------------------------|----|----|-------------|---------|----|-------|------|----------|-------|--------|--------|----------|----------|--------|----|-------|
| 29 | Obtain program Line Item Number (LIN)               | Output   | Sustainment                 | A2 | 3  | 0           | 0       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 1        | 1        | 0      | 0  | 2     |
| 30 | Chair Product Support Assessment Team               | Function | Manage Stakeholders         | A2 | 4  | 0           | 0       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 1        | 0        | 0      | 0  | 1     |
| 31 | Conduct Core Logistics Assessment                   | Output   | Sustainment                 | A2 | 3  | 0           | 0       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 1        | 0        | 0      | 0  | 1     |
| 32 | Conduct Depot Source of Repair Analysis             | Output   | Sustainment                 | A2 | 3  | 0           | 0       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 1        | 0        | 0      | 0  | 1     |
| 33 | Conduct Operation and Sustainment Reviews (OSRs)    | Output   | Sustainment                 | A2 | 3  | 0           | 0       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 1        | 0        | 0      | 0  | 1     |
| 34 | Conduct supportability assessments                  | Output   | Sustainment                 | A2 | 3  | 0           | 0       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 1        | 0        | 0      | 0  | 1     |
| 35 | Conduct Total Life Cycle Systems Management (TLCSM) | Output   | Sustainment                 | A2 | 3  | 0           | 0       | 0  | 0     | 1    | 0        | 0     | 0      | 0      | 0        | 0        | 0      | 0  | 1     |
| 36 | Obtain provisioning data                            | Output   | Sustainment                 | A2 | 3  | 0           | 0       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 0        | 0        | 1      | 0  | 1     |
| 37 | Obtain statement of supportability                  | Output   | Sustainment                 | A2 | 3  | 0           | 0       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 0        | 1        | 0      | 0  | 1     |
| 38 | Obtain Materiel Release                             | Output   | Milestone Decision          | A3 | 4  | 0           | 0       | 0  | 0     | 0    | 1        | 0     | 0      | 0      | 1        | 25       | 0      | 0  | 27    |
| 39 | Obtain Type Classification                          | Output   | Milestone Decision          | A3 | 4  | 0           | 0       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 1        | 7        | 0      | 0  | 8     |
| 40 | Coordinate Milestone Meetings                       | Function | Conduct Milestone Review    | A3 | 4  | 0           | 1       | 0  | 0     | 4    | 0        | 0     | 0      | 0      | 1        | 0        | 0      | 0  | 6     |
| 41 | Conduct RFP Release Decision Point                  | Output   | Milestone Decision          | A3 | 4  | 0           | 4       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 0        | 0        | 0      | 0  | 4     |
| 42 | Conduct FRP Decision Review                         | Output   | Milestone Decision          | A3 | 4  | 0           | 2       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 0        | 1        | 0      | 0  | 3     |
| 43 | Initiate recapitalization                           | Output   | Milestone Decision          | A3 | 4  | 0           | 0       | 0  | 0     | 3    | 0        | 0     | 0      | 0      | 0        | 0        | 0      | 0  | 3     |
| 44 | Conduct MDD                                         | Output   | Milestone Decision          | A3 | 4  | 0           | 0       | 0  | 0     | 2    | 0        | 0     | 0      | 0      | 0        | 0        | 0      | 0  | 2     |
| 45 | Conduct PDR                                         | Output   | Test Data                   | A2 | 3  | 0           | 2       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 0        | 0        | 0      | 0  | 2     |
| 46 | Coordinate Exit Criteria                            | Output   | Milestone Decision          | A3 | 4  | 0           | 0       | 0  | 0     | 0    | 0        | 0     | 1      | 0      | 1        | 0        | 0      | 0  | 2     |
| 47 | Conduct CDR                                         | Output   | Test Data                   | A2 | 3  | 0           | 0       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 1        | 0        | 0      | 0  | 1     |
| 48 | Conduct MS B                                        | Output   | Milestone Decision          | A3 | 4  | 0           | 1       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 0        | 0        | 0      | 0  | 1     |
| 49 | Conduct MS C                                        | Output   | Milestone Decision          | A3 | 4  | 0           | 1       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 0        | 0        | 0      | 0  | 1     |
| 50 | Obtain personnel resources                          | Output   | Analysts                    | A2 | 2  | 0           | 0       | 0  | 0     | 2    | 0        | 0     | 0      | 0      | 4        | 1        | 0      | 0  | 7     |
| 51 | Supervise and evaluate personnel (PMs)              | Output   | Analysts                    | A2 | 2  | 0           | 0       | 0  | 0     | 1    | 0        | 0     | 0      | 0      | 3        | 0        | 0      | 0  | 4     |
| 52 | Provide program data                                | Function | Execute Acquisition         | A2 | 3  | 0           | 12      | 0  | 0     | 1    | 1        | 0     | 0      | 0      | 0        | 0        | 0      | 0  | 14    |
| 53 | Develop and manage contracts                        | Output   | COR Guidance / Cont Package | A2 | 3  | 0           | 0       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 2        | 0        | 0      | 0  | 2     |
| 54 | Request requirement changes                         | Function | Manage Requirements         | A2 | 1  | 0           | 2       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 0        | 0        | 0      | 0  | 2     |
| 55 | Perform risk management                             | Function | Execute Acquisition         | A2 | 3  | 0           | 0       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 1        | 0        | 0      | 0  | 1     |
| 56 | Complete mandatory reporting                        | Function | Execute Acquisition         | A2 | 3  | 0           | 20      | 0  | 1     | 25   | 8        | 0     | 0      | 0      | 2        | 2        | 0      | 4  | 62    |
| 57 | Conduct Weapon System Reviews (WSRs)                | Output   | Test Data                   | A2 | 3  | 0           | 0       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 1        | 0        | 0      | 0  | 1     |
| 58 | Advise requirement validation authority             | Function | Manage Requirements         | A2 | 1  | 0           | 5       | 0  | 0     | 5    | 0        | 0     | 3      | 0      | 0        | 0        | 0      | 0  | 13    |
| 59 | Assess interoperability                             | Output   | Test Data                   | A2 | 3  | 0           | 0       | 0  | 0     | 1    | 1        | 0     | 0      | 0      | 0        | 0        | 0      | 0  | 2     |

| ID | WORK ELEMENT                                                                  | IDEF     | Element                      | A0 | AX | JCIDS JAN15 | DoD5000 | AR | PAM 1 | AR 7 | NEW AR 7 | AR 73 | PAM 73 | AR 700 | AR 700-1 | AR 700-1 | AR 702 | FI | TOTAL |
|----|-------------------------------------------------------------------------------|----------|------------------------------|----|----|-------------|---------|----|-------|------|----------|-------|--------|--------|----------|----------|--------|----|-------|
| 60 | Conduct technology demonstrations                                             | Output   | Test Data                    | A2 | 3  | 0           | 1       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 0        | 0        | 0      | 0  | 1     |
| 61 | Risk analysis of preferred design                                             | Function | Execute Acquisition          | A2 | 3  | 0           | 1       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 0        | 0        | 0      | 0  | 1     |
| 62 | Collaborate with PEO STRI                                                     | Function | Manage Stakeholders          | A2 | 5  | 0           | 0       | 0  | 0     | 1    | 2        | 0     | 0      | 0      | 0        | 0        | 0      | 0  | 3     |
| 63 | Continuous collaboration with stakeholders                                    | Function | Manage Stakeholders          | A2 | 5  | 0           | 6       | 0  | 0     | 0    | 21       | 3     | 3      | 0      | 0        | 0        | 0      | 1  | 34    |
| 64 | Obtain licenses, certifications, exemptions                                   | Function | Manage Stakeholders          | A2 | 5  | 0           | 1       | 0  | 0     | 0    | 3        | 0     | 0      | 0      | 0        | 3        | 0      | 1  | 8     |
| 65 | Establish Memorandum of Agreement/Understanding                               | Function | Develop Stakeholder Strategy | A1 | 5  | 0           | 0       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 1        | 0        | 0      | 0  | 1     |
| 66 | Establish metrics                                                             | Output   | Acq Docs                     | A1 | 3  | 0           | 0       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 7        | 0        | 0      | 0  | 7     |
| 67 | Chair T&E WIPT                                                                | Output   | Manage Stakeholders          | A2 | 4  | 0           | 0       | 0  | 0     | 0    | 0        | 4     | 1      | 0      | 0        | 0        | 0      | 0  | 5     |
| 68 | Develop RAM program                                                           | Output   | Test Data                    | A1 | 3  | 0           | 2       | 0  | 0     | 0    | 0        | 0     | 1      | 0      | 0        | 0        | 1      | 0  | 4     |
| 69 | Draft and coordinate RAM-C report                                             | Output   | Test Data                    | A2 | 3  | 0           | 0       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 2        | 0        | 1      | 0  | 3     |
| 70 | Participate in Test Readiness Reviews                                         | Output   | Test Data                    | A2 | 3  | 0           | 0       | 0  | 0     | 0    | 0        | 0     | 3      | 0      | 0        | 0        | 0      | 0  | 3     |
| 71 | Manage Developmental Testing                                                  | Output   | Test Data                    | A2 | 3  | 0           | 0       | 0  | 0     | 0    | 1        | 2     | 0      | 0      | 0        | 0        | 0      | 0  | 3     |
| 72 | Chair DT RAM scoring conference                                               | Function | Manage Stakeholders          | A2 | 3  | 0           | 0       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 0        | 0        | 1      | 0  | 1     |
| 73 | Delay or suspend DT, if necessary                                             | Output   | Test Data                    | A2 | 3  | 0           | 0       | 0  | 0     | 0    | 0        | 1     | 0      | 0      | 0        | 0        | 0      | 0  | 1     |
| 74 | Design RAM program                                                            | Output   | Acq Docs                     | A1 | 3  | 0           | 0       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 0        | 0        | 1      | 0  | 1     |
| 75 | Determine LFT&E requirements                                                  | Output   | Acq Docs                     | A1 | 3  | 0           | 0       | 0  | 0     | 0    | 0        | 1     | 0      | 0      | 0        | 0        | 0      | 0  | 1     |
| 76 | Develop and use Reliability Growth Curve                                      | Output   | Acq Docs                     | A1 | 3  | 0           | 0       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 0        | 0        | 1      | 0  | 1     |
| 77 | Develop RAM specifications                                                    | Output   | Acq Docs                     | A1 | 3  | 0           | 0       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 0        | 0        | 1      | 0  | 1     |
| 78 | Establish RAM test criteria                                                   | Output   | Acq Docs                     | A1 | 3  | 0           | 0       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 0        | 0        | 1      | 0  | 1     |
| 79 | Establish RAM WG                                                              | Function | Manage Stakeholders          | A2 | 4  | 0           | 0       | 0  | 0     | 0    | 0        | 0     | 0      | 0      | 0        | 0        | 1      | 0  | 1     |
| 80 | Manage T&E waivers                                                            | Function | Manage Stakeholders          | A2 | 4  | 0           | 0       | 0  | 0     | 0    | 0        | 1     | 0      | 0      | 0        | 0        | 0      | 0  | 1     |
| 81 | Resolve T&E delay/suspension issues. Provide update and recommendation to MDA | Function | Manage Stakeholders          | A2 | 4  | 0           | 0       | 0  | 0     | 0    | 0        | 1     | 0      | 0      | 0        | 0        | 0      | 0  | 1     |
| 82 | Develop and provide the Safety Assessment Report                              | Output   | Acq Docs                     | A1 | 3  | 0           | 0       | 0  | 0     | 0    | 1        | 0     | 0      | 0      | 0        | 0        | 0      | 0  | 1     |

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## **APPENDIX B. DEFINITIONS FOR KEY TERMS**

### **Acquisition Manager**

No definition is provided in the key documents analyzed by this joint applied project.

### **Activity Manager**

No definition provided in the Financial Management Regulation, which is the only document to use the term out of the documents analyzed by this joint applied project.

### **Materiel Developer (MATDEV)**

“The RDA command, agency, or office assigned responsibility for the system under development or being acquired. The term may be used generically to refer to the RDA community in the materiel acquisition process (counterpart to the generic use of CAPDEV)” (AR 70–1, 2017, p. 51).

“The MATDEV is a PM or other responsible person that works for the development and acquisition command or agency for the system under development or being acquired” (AR 73–1, 2016, p. 66).

“The research, development, and acquisition command, agency, or office assigned responsibility for the system under development or being acquired. This position can refer to the PEO, program or project manager, or others assigned to this function by the developing agency” (AR 73–1, 2016, p. 87).

“The command, organization, or agency responsible for accomplishing life cycle management of a materiel solution to include research, development, production, fielding, sustainment, demilitarization, and disposal in response to approved CRDs” (AR 700–127, 2016, p. 59).

### **Materiel Development Organization**

No definition provided in the Army Regulation 702–19, 2015, which is the only document to use the term out of the documents analyzed by this joint applied project.

### **Program Manager (PM), Product Manager (PdM), Project Manager (PM)**

“An HQDA CSL manager for a system or program. A PM may be subordinate to the AAE, PEO, or DRPM. Refers to the management level of intensity the Army assigns to a particular weapon system or IS. As a general rule, a program manager is a GO or SES member; a project manager is an O–6, a GS–15, or the broadband or pay band equivalent; a product manager is an O–5, a GS–14, or the broadband or pay band equivalent” (AR 70–1, 2017, p.52).

### **Program, Project or Product Management Office (PMO)**

No formal definition is provided in any of the documents analyzed by this joint applied project. Army Regulation 70–1, p. 45 list of acronyms may be taken to imply that “PMO” may be taken to mean the office of any program, project or product manager.

### **Resource Sponsor**

No definition is provided in the Department of Defense Manual for the Operation of the Joint Capabilities Integration and Development System (JCIDS), 2015, which is the only document to use the term out of the documents analyzed in this joint applied project. The two uses of the term both closely associate it with PMs as in “(3) PMs/Resource Sponsors should coordinate with the Joint Staff J6 for approval of their intent to use the PIIT in a capability requirement document or ISP” (Chairman of the Joint Chiefs of Staff, 2015, p.D-E-8).

### **Solution Sponsor**

The Department of Defense Manual for the Operation of the Joint Capabilities Integration and Development System (JCIDS), 2015 does not provide a formal definition, but instead refers (p.GL-8) to the definition for document sponsor.

Document Sponsor – The organization submitting a capability requirement document. Solution Sponsors for successor documents – Capability Development Documents (CDDs), Capability Production Documents (CPDs), and Joint DOTmLPF-P Change Recommendations (Joint DCRs) - may be different than the Requirement Sponsors for initial documents – Initial Capabilities Documents (ICDs), Urgent Operational Needs (UONs), Joint UONs (JUONs), and Joint Emergent Operational Needs (JEONs). Different Sponsors for requirements and solutions can occur when the initial

document Sponsor does not have acquisition authority and a different organization is designated to develop and field a capability solution, or when one Sponsor elects to leverage a previously validated document generated by a different Sponsor. (Chairman of the Joint Chiefs of Staff, 2015, p. GL-6)

A conflicting definition is presented by the JCIDS Manual “(b) Recommended Solution Sponsor. This is the DoD component proposed to be responsible for funding, developing, and fielding the capability solution, in support of the Requirement Sponsor” (Chairman of the Joint Chiefs of Staff, 2015, p. G-6).

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## LIST OF REFERENCES

- Chairman of the Joint Chiefs of Staff. (2015, January 23). *Joint Capabilities Integration and Development System* (JCIDS). (CJCSI Instruction 3170.01I). Washington, DC: Author.
- Chairman of the Joint Chiefs of Staff. (2015, February 12). *Manual for the operation of the Joint Capabilities Integration and Development System* (JCIDS). (JCIDS Manual). Washington, DC: Author.
- Defense Acquisition University. (n.d.). *Defense Acquisition Guidebook* Chapter 1 Program Management. Retrieved from <https://www.dau.mil/tools/dag>
- Department of the Army. (2015, June 02). Type classification, materiel release, fielding, and transfer (AR 700–142). Washington, DC: Author.
- Department of Defense. (2015a, January 7). Operation of the Defense Acquisition System (DoD Instruction 5000.02). Washington, DC: Author.
- Department of the Army. (2011, July 22). Army acquisition policy (AR 70–1). Washington, DC: Author.
- Department of the Army. (2016, October 11). Integrated product support (AR 700–127). Washington, DC: Author.
- Department of the Army. (2016, November 16). Test and evaluation policy (AR 73–1). Washington, DC: Author.
- Department of the Army. (2017, June 16). Army acquisition policy (AR 70–1). Washington, DC: Author.
- Feldmann, C. (1998) *The practical guide to business process reengineering using IDEF0*. New York, NY: Dorset House Publishing
- General Accounting Office (GAO). (2015, February). *Acquisition Reform—DoD should streamline its decision-making process for weapon systems to reduce inefficiencies* (GAO-15-192). Washington, DC: Author.
- IDEF0. (n.d.) In Wikipedia. Retrieved January 12, 2018, from <https://en.wikipedia.org/wiki/IDEF0>.
- Milley, M., and McCarthy, R. (October 03, 2017). *Modernization priorities for the United States Army* [Memorandum]. Washington, DC: Office of the Secretary of the Army (USA). Retrieved from <https://admin.govexec.com/media/untitled.pdf>

- Pickar, C., & Jones, R. (2014) Engineering the business of Defense Acquisition: An analysis of Program Office processes. Retrieved from [https://www.researchgate.net/publication/274457202\\_Engineering\\_the\\_Business\\_of\\_Defense\\_Acquisition\\_An\\_Analysis\\_of\\_Program\\_Office\\_Processes](https://www.researchgate.net/publication/274457202_Engineering_the_Business_of_Defense_Acquisition_An_Analysis_of_Program_Office_Processes)
- Project Management Institute. (2017). *A guide to the project management body of knowledge* (6th ed.).
- Project Management Institute. (2017). *PMI lexicon of project management terms* (Version 3.2).
- Shyu, H. (2015, April 23). Acquisition Accountability Bus. PowerPoint presentation to the SASC, Washington, DC.
- Simpson, J. (January 18, 2017). *Baseline for the Procurement Action Lead Time (PALT)* [Memorandum]. Redstone Arsenal, AL: United States Army Contracting Command.
- Vergun, D. (2015, April 23). Shyu urges Congress to give more authority to program managers. Retrieved from [https://www.army.mil/article/147040/shyu\\_urges\\_congress\\_to\\_give\\_more\\_authority\\_to\\_program\\_managers](https://www.army.mil/article/147040/shyu_urges_congress_to_give_more_authority_to_program_managers)
- Weisgerber, M. (2015, October 8). U.S. Army's new chief sets three goals. *Defense One*. Retrieved from <http://www.defenseone.com/business/2015>.

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