Information Technology (IT) Acquisition Workforce Competency Assessment Report

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Executive summary

The Director of Human Capital Initiatives (HCI) for the Department of Defense's (DoD) Acquisition, Technology, and Logistics (AT&L) workforce supports the development of acquisition personnel and leaders, enabling them to make important business decisions that provide the best dollar value while supporting DoD agencies' missions. HCI initiatives include programs such as competency development and assessment. HCI's goals include improving acquisition workforce performance, making necessary investments in training, conducting trend analysis, and emphasizing the criticality of the acquisition workforce to DoD mission success.

HCI works in conjunction with the Defense Acquisition University (DAU), which supports DoD and other Federal agencies in the certification, training, and development of the acquisition workforce. This focus on certification, training, and development was the impetus for adopting a competency-based approach to optimize workforce effectiveness. At HCI's request, CNA is working with HCI and workforce representatives to develop competency models for each of the major career fields within the AT&L workforce. This report focuses on the competencies identified for the Information Technology (IT) Acquisition career field, which includes individuals in the Departments of Air Force, Army and Navy and in Fourth Estate agencies.

Together, HCI, IT leadership, and subject matter experts (SMEs), with guidance from CNA, developed and validated a model of performance consisting of competencies determined to be necessary to meet IT Acquisition's operational goals (presented in its entirety in Appendix A). We used the model to create a competency assessment, in which we invited all IT Acquisition employees (and their supervisors) to participate. Respondents reported on their (the employees') proficiency on each competency element. They also indicated how critical each competency element was to their job. Employees (not supervisors) indicated how frequently they perform each competency element and responded to 26 demographic and intentions questions.

The analyses in this report make use of data collected via the competency assessment to address the following research goals: (1) to assess

the current IT Acquisition capabilities of the workforce, (2) to describe how those capabilities are distributed across DoD organizations and communities, and (3) to determine the potential of the current IT Acquisition workforce to boost DoD's IT Acquisition capability.

Participation rates

According to the 2011 4th quarter DataMart[1] list, the IT Acquisition population consists of approximately 5,400 employees. Approximately 700 additional employees were identified during the assessment process and invited to participate. Of 6,066 employees and supervisors invited, 1,609 participated in the competency assessment across all workforce segments (services and Fourth Estate agencies), which represent 27 percent of the IT Acquisition population. The assessment yielded a 3 percent response rate for supervisor and employee pairs. Therefore, we use employee only response for the analysis presented in this report.

The 27 percent of the workforce that responded was not necessarily a random sample. A random sample would help us to extrapolate to the workforce as a whole. From our examination of the demographic dimensions that we were able to explore, we found no major evidence of non-randomness in the sample. Additionally, we reweighted responses based on population proportions of component, certification level, and years of experience. Despite this, caution should still be exercised in extrapolating these results to represent the entire workforce. These results do represent the 27 percent of the workforce who responded to the assessment.

Workforce demographics

The IT Acquisition workforce that responded to the assessment can be summarized as follows. Most are Federal civilians with prior military experience; however, most individuals have low IT Acquisition experience. A plurality of the respondents reside in the GS 11-13 pay band and self-assess at the Senior career level. A majority of the

1. The DataMart is a database that provides HCI with information on the individuals that make up each of the acquisition career fields, including IT Acquisition.

respondents are over the age of 45. A majority of the respondents hold a bachelor's degree or higher, while 32 percent hold a master's degree or higher. The majority would be willing to serve as a mentor. Finally, approximately 13 percent of the respondents indicate retirement intentions within four years.

Competency analyses

The developed IT Acquisition competency model (depicted in Section 1) contains both technical and professional units of competence. Technical units consist of Acquisition Planning, Program/Project Management, and Technical/System Management. In total, 36 competencies (28 technical and 8 professional) make up the workforce's model.

Analysis of employee responses suggests that the IT Acquisition competency model captures the professional competencies most pertinent to the workforce. There was considerable variability in the percentage of technical competencies rated with an importance value of medium or higher: The Air Force and Navy rated 60 percent and 61 percent of the technical competencies as having medium or higher importance, the Army rated 28 percent as having medium or higher importance, and Fourth Estate respondents rated 48 percent at or above medium importance.

When asked which competencies they intend to boost over the next 12 months, the top ten responses were all technical competencies (not professional). This suggests that respondents believe technical competencies are important to the IT Acquisition career field, regardless of the values reflected in the analysis of criticality and frequency.

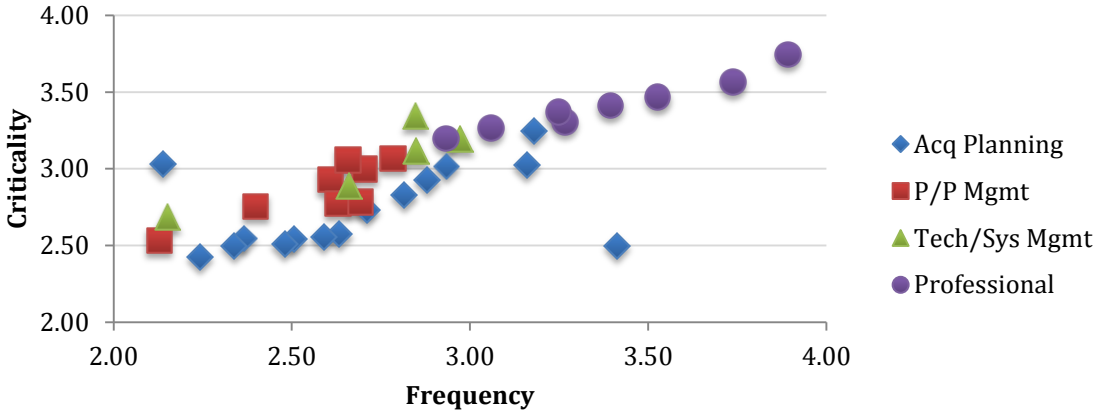
Findings

We found that a majority of employees at Senior career levels report a Level III certification, whereas those at the Journeyman career level report Level I and Level II certification equally.

We found the relative importance of competencies to be fairly consistent across components and the Fourth Estate agencies. Data show

that a large majority of technical competencies assessed are used infrequently (as seen in figure 1).

Figure 1. Relative Importance of competencies across IT Acquisition workforce



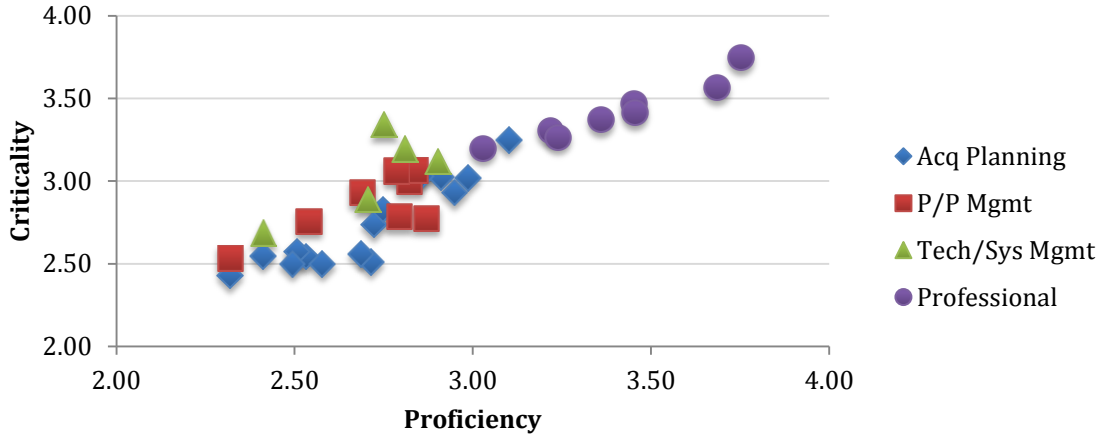
Criticality: 1 = not critical; 2 = somewhat critical; 3 = fairly critical; 4 = very critical; 5 = extremely critical.
Frequency: 1 = almost never; 2 = rarely; 3 = occasionally; 4 = frequently; 5 = very frequently

Professional competencies, of all those assessed, appear to be the most critical, as perceived by the workforce; they are also assessed to be the most highly important competencies across workforce components. In an aggregate form, all professional competencies, except for one, are considered highly important within the IT Acquisition workforce. A competency is determined to be highly important if both criticality and frequency are reported to be at or above a 3.0 value.

The Technical/System Management and Program/Project Management units of competence are generally viewed as having a higher importance value than the Acquisition Planning unit of competence. Technical competencies tend to progress upwards in perceived importance, linearly, as career levels increase. For example, competencies within the Technical/System Management unit increase from a low/medium value within the Entry career level, to a medium/high value within the Journeyman level, to a highly important value amongst those identified within the Senior career level. No technical competencies were determined to be highly important across the three career levels. However, three were determined to be highly important across two career levels: Deployment and Transition Planning; Requirements Management; and Technical Reviews and Audits.

As seen in figure 2, professional competencies are not only reported to be the most critical, but they are also the competencies in which the workforce is most proficient. The workforce as a whole reported intermediate to advanced proficiency (figure 2) in professional competencies, across career levels and basic to intermediate proficiency in technical competencies.

Figure 2. Relative proficiency in competencies across IT Acquisition workforce



Criticality: 1 = not critical; 2 = somewhat critical; 3 = fairly critical; 4 = very critical; 5 = extremely critical.
Proficiency: 1 = awareness; 2 = basic; 3 = intermediate; 4 = advanced; 5 = expert

We focused our proficiency gap analysis on competencies that were determined to be highly important by at least two of the three career levels. Based on this framework, the IT Acquisition workforce does not currently exhibit gaps in its proficiency.

However, four competencies had earlier been identified by IT Acquisition leadership and SMEs as being associated with superior performance. These competencies are IT Acquisition Strategies and Approaches, Risk Management, Best Practices, and Contracting. Gaps were revealed between how Entry and Journeyman assessment respondents perceived the importance of these competencies and how leadership and SMEs perceived the importance of these competencies.

In addition, our retirement intentions analysis found that, within four years, two important IT Acquisition workforce competencies are expected to be affected by member departures—IT Acquisition Strategies and Approaches, and Leading Change.

Recommendations

We recommend that IT Acquisition leadership consider using our analysis results to accomplish the following empirically grounded recommendations. (These recommendations and their ties to the literature are expanded upon in section 7.)

- Conduct performance audits in order to develop proficiency standards (Cizek, Bunch, & Koons, 2004; Gilbert, 2007).
- Develop gap-closure strategies for high-importance competencies that may have lower proficiency ratings and for those important competencies shown to be exiting the system within four years – the two important competencies expected to be most affected by retirement in the next four years are (1) IT Acquisition Strategies and Approaches and (2) Leading Change.
- Consider developing mentoring programs (Murry, 2006) that emphasize those competencies shown to be highly important in the mentees' current and subsequent career level.
- Design and develop professional growth programs that align with career level and the importance value of competencies (Dubois, 1993; Spencer & Spencer, 1993; Zwell, 2000). For example, data show that Leading Change is a highly important professional competency within the Senior career level, across all components, but not within lower career levels.
- Develop materials that educate the workforce to the benefits of competency development through professional growth programs (Lucia & Lepsinger, 1999). Place a strong emphasis on the development of professional competencies (Abraham, Karns, Shaw, & Mena, 2001). Responses to the assessment indicate that professional competencies captured in the IT Acquisition model are universally important to the entire workforce. The high-importance competencies may need to be boosted as the workforce ages and leadership experience is lost to retirement.
- Finally, use the developed competency model to support alignment of performance planning and appraisal initiatives (Spencer & Spencer, 1993).

Section 1: Background and model overview

There has been congressional and OSD pressure to improve the quality of the AT&L workforce and to overcome personnel challenges in order to help the Department of Defense (DoD) effectively perform its acquisition mission. As part of the AT&L workforce, the IT Acquisition career field, as advisors to commanders, program executive officers, program managers, and other acquisition decision-makers, contributes to IT Acquisition management of defense programs.

Information Technology includes computer scientists, information technology management specialists, computer engineers, telecommunications managers, etc., who directly support the acquisition of information technology. This may include hardware, software, or firmware products used to create, record, produce, store, retrieve process, transmit, disseminate, present, or display data or information. The employee identifies requirements; writes and/or reviews specifications; identifies costs; obtains resources (manpower, funding, and training); supports portfolio management, information assurance, and IT-architecture-related activities; and tests, evaluates, plans, obtains, and manages life cycle development and support (operations, maintenance, and replacement).[2]

This report presents the recent assessment of the competencies of the AT&L IT Acquisition career field. The Office of Personnel Management (OPM) describes a competency as "an observable, measurable pattern of skills, knowledge, abilities, behaviors and other characteristics that an individual needs to perform work roles or occupational functions successfully." OPM's definition of a competency is the foundation on which AT&L workforce competency models are built. The IT Acquisition workforce competency-based assessment described here aligns with the AT&L Human Capital Strategic Plan

[2] Retrieved 29 June, 2012 from: https://dap.dau.mil/career/irm/Pages/Default.aspx

and is one element of an approach by the Human Capital Initiatives (HCI) Office to prepare the AT&L workforce for the future.[3]

Competence measures have been used to assess organizations and their workforces for nearly 40 years. Beginning with the work of McClelland (1973; 1998), psychologists and researchers have been assessing the knowledge, skills, abilities, and behaviors that are found to be associated with exemplary performance (e.g., Gilbert, 2007, Lucia & Lepsinger, 1999; Shippmann et al., 2000; Spencer & Spencer, 1993) in order to drive positive organizational change (Dubois, 1993). To ensure high levels of rigor in the competency modeling process (Shippmann et al., 2000), time-tested mechanisms such as behavioral, event-based interviews (e.g., Flanagan, 1954; McClelland, 1998) are coupled with Subject Matter Expert (SME) panels and a validation process (Spencer & Spencer, 1993). Validated models have routinely been used in the effective management of human capital practices such as leadership development, recruiting and selection, and succession planning (Gangani, McLean, & Braden, 2006).

The IT Acquisition workforce assessment is part of a larger competency assessment program addressing all career fields within the AT&L community.[4]

Research objectives

The research goals for the overall AT&L Competency Program are the following:[5]

- AT&L Goal-1: Define the competencies required to deliver (needed) capabilities.
- AT&L Goal-2: Assess the workforce to identify current and future gaps.

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[3] Ken Krieg, Under Secretary of Defense for Acquisition, Technology & Logistics, *AT&L Human Capital Strategic Plan v3.0,* 2007.

[4] Department of Defense, Acquisition, Technology & Logistics, *AT&L Human Capital Strategic Plan v3.0,* 2007.

[5] Department of Defense, Acquisition, Technology & Logistics, *AT&L Human Capital Strategic Plan v3.0,* 2007.

The competency model used for this assessment satisfies the first AT&L goal. The assessment results shared in this report will help achieve the second goal.

Model components

AT&L competency models have both a technical and a professional component. Technical competencies are function-specific competencies associated with a career field (e.g., Design Engineering and Architecture). Professional competencies are leadership, relational, cognitive, and management-focused and can be applied to all career fields (e.g., Communication). Competency models contain high-level units of competence that hold more descriptive competencies with concise descriptions of behaviors and the associated goal of the behavior needed to demonstrate the competency (referred to as competency elements). In addition, competencies often include short statements about the knowledge required to perform the behaviors (referred to as knowledge items).

Model development

The IT Acquisition competency model was developed and validated in four phases. In **Phase I,** the competency assessment model development phase, career field leadership served as an expert panel (EP). Those leaders identified the behaviors, skills, characteristics, and knowledge they believe are required to be a successful IT Acquisition employee. Through successive discussions between IT Acquisition leadership and CNA, this information was developed into a competency model framework, which was then used to solicit more detailed competency information from a larger group of subject matter experts (SMEs).

At the end of Phase I, expert panel members identified successful IT Acquisition employees from all representative DoD services and agencies to serve as SMEs and to support development of a model from the framework. Participants represented the entire IT Acquisition workforce population. The selection process for SMEs ensured that those designated as SMEs were experienced, superior employees. This process in turn ensured that the final competency model would accurately reflect successful performance criteria.

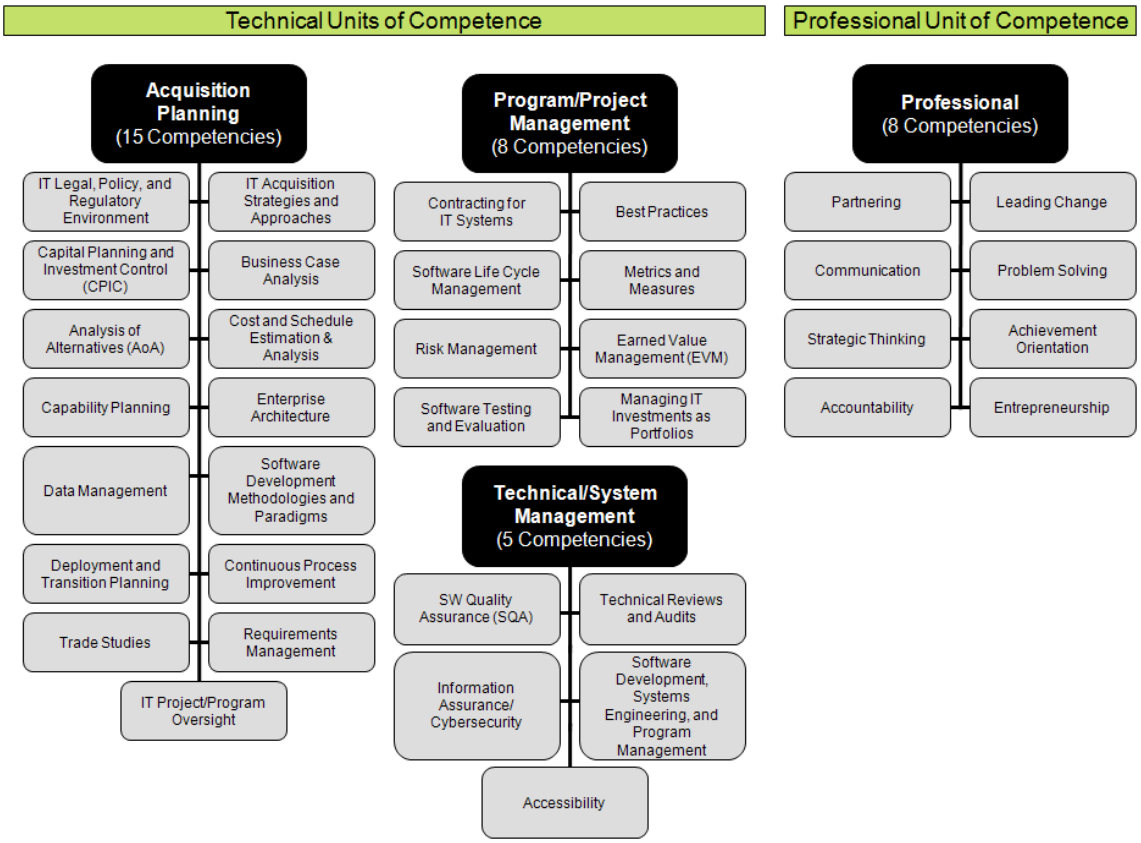
In **Phase II**, SMEs were asked to provide data about what makes them successful in their jobs. The CNA research team devised a multifaceted approach to collecting the data. Use of CNA's online data collection tool facilitated collection of demographic information, framework validation, and descriptions of key situations. IT Acquisition SMEs were first asked to provide demographic information. SMEs were also asked to add or suggest removal of competencies, elements, and knowledge items. Finally, a structured set of questions asked SMEs to compare their job responsibilities with the framework of competencies and provide examples from their own experiences of successful job performance. This process allowed CNA to collect both qualitative and quantitative data needed to validate competencies required for superior performance.

Of note from Phase II, four competencies were identified by IT Acquisition leadership and SMEs as being particularly associated with superior performance. These competencies were IT Acquisition Strategies & Approaches, Risk Management, Best Practices, and Contracting.

In **Phase III,** CNA worked with IT Acquisition leadership and workforce experts to decide how to use the information provided by the SMEs to refine the IT competency framework developed by the expert panel. CNA used this resulting competency model to build a Web-based assessment tool to capture workforce-wide assessment data.

The IT Acquisition competency model consists of 55 elements with 28 technical and eight professional competencies, all organized into four units of competence. Figure 3 shows the final IT competency model, and Appendix A contains a list of the detailed elements. The Phase IV assessment of the IT Acquisition workforce used this competency model.

Figure 3. IT Acquisition competency model



Phase IV of the IT competency assessment process began December 5, 2011. At that time, CNA administered the assessment to the IT Acquisition workforce. CNA, HCI, and IT leadership determined that an additional two weeks would be allocated for the assessment period because of reduced workforce presence over DoD-observed Christmas and New Year's holidays. Employees had six weeks to complete the assessment before the assessment closed January 20, 2012. The analyses of employee-provided proficiency, criticality, and frequency ratings are described in this report.

Survey approval

The Director of Human Capital Initiatives submitted the assessment survey to the Defense Manpower Data Center (DMDC) and Washington Headquarters Services (WHS) for survey approval in late 2009. We received survey approval in July 2010, under WHS survey license number DD-AT&L (AR) 2431.

Section summary

CNA developed the Competency Model for the IT Acquisition workforce using the same process used for each of the other DoD Acquisition workforces. This process starts with a small group of Expert Panel members who develop a framework for the model. The process then expands the audience to a larger group of SMEs from across the workforce, who validate the content in the framework to produce the recommended model. Finally, we assess the still broader workforce population against this model. This final assessment provides demographic data and proficiency and importance ratings. The assessment survey was approved, prior to the launch of the assessment, by both DMDC and WHS.

Section 2: Rating and analysis methodology

The intent for this study was to conduct an assessment using a large sample of IT Acquisition employees. We received 1,609 employee assessment responses. The response rate was evaluated against population statistics in order to understand the degree to which the participants are reflective of the population. Therefore, our discussion of methodology starts with a discussion of the observed participation rates.

Participation rates

Initially, 5,376 employees and their supervisors received an invitation to participate in the competency assessment. Participants were asked to supply the name and email address of individuals they believed should receive the assessment, if not previously identified. An additional 690 members were identified. Individuals were validated based upon their reported community involvement and occupational/job code series. Furthermore, an individual's response was removed from the data if the employee was identified as a contractor by "ctr" in his or her email address. Overall, 27 percent of the IT Acquisition workforce participated in the assessment. Across all services and agencies, employees completed 1,609 assessments.

Respondents were asked to identify their supervisor/s, if not correctly listed. We received 167 paired, or employee-supervisor, responses (3 percent of the workforce, or 12 percent of the respondents). Because of the low supervisor response rate, we did not incorporate supervisor assessments into the competency analyses. Some individuals completed the assessment as both an employee and a supervisor; in those cases only the employee response was included in our calculations. Participation rates for the overall IT Acquisition workforce and for each of the four segments of the workforce – Air Force, Army, Navy, and Fourth Estate – are shown in table 1.

Table 1. Participation rates by IT Acquisition workforce component

Component	Population	Responded	Response rate
Air Force	1259	356	28%
Army	2414	568	24%
Navy/Marine Corps	1941	541	28%
Other Defense/4th Estate	452	144	32%
TOTALS:	**6066**	**1609**	**27%**

As previously mentioned, the 27 percent of the workforce that responded was not a random sample, which is needed to statistically extrapolate to the workforce as a whole. The non-randomness was introduced because there may have been non-random factors driving those who responded to the survey versus those who did not respond to the survey. However, based on the demographic dimensions (MIL/CIV, certification level, component, and years of experience) for which we were able to compare the sample against the population, we believe that the results will not differ greatly from results that would have been derived had we been able to analyze a truly random sample. In addition, for our competency analysis, we took the further step of reweighting the sample to mirror population proportions.

Our reweighting process assigned a particular weight to each respondent, based on population proportions relative to sample proportions, using the following characteristics that were measurable in both the population data and the sample data:

- Component
- Certification Level
- Years of Experience

We used 2011/Q4 Data Mart data to derive the population weights. Dividing each population weight by each sample weight provided the values we used for reweighting the competency measures.

Incorporating a reweighting process allows us greater confidence in representing the population. Based upon their weights, sample respondents either "over represent" or "under represent" the population in each of their competency element responses. The reweighting corrects for this bias.

We achieved our desired sample size for all but Fourth Estate agencies. A complex mix of perspectives found within the various agencies (e.g., Defense Information Systems Agency, Defense Contract Management Agency (DCMA), Defense Threat Reduction Agency (DTRA), Missile Defense Agency (MDA)) further complicates interpretation of results related to Other Defense/Fourth Estate.

To ensure that the data set contained reliable data for analysis, we validated the data set and excluded the following scenarios from the analysis:

- *If the employee selected 0: (Not needed in my job) in the frequency or criticality rating for an element.*
- *If the employee selected 0: (No exposure to or awareness of this competency) in the proficiency rating for an element.*
- *If a systematic response pattern was identified (i.e., AAA, ABA, ABB, etc.).*

Because of low supervisor response rates, most recent competency analyses have relied on data from employee responses rather than employee-supervisor paired responses. This was the case in this IT Acquisition competency assessment as well.

Ideally, one would use a multi-rater approach for the workforce assessment by capturing criticality and proficiency ratings for each employee from both the employee and his or her supervisor. However, the response rate for paired IT Acquisition employee-supervisor assessments (167 pairs) was too low to provide sufficient data for analysis. Therefore, we use only employee responses. This approach provides the largest consistent set of responses for our analysis. The results are, however, less verifiable than employee-supervisor paired responses, because the employee proficiency and criticality responses have not been validated against supervisor responses. Although a reduced level of validation may be experienced, use of this methodology does not affect the overall validation of the competency model. The Phase IV assessment is the culmination of a triangulation process (Merriam, 2009; Yin, 2009) that incorporated several sources of data to arrive at the presented competency model. The multi-phase process is considered to have a high level of rigor (Shippmann et al., 2000).

Competency ratings

Employees rated their own proficiency for each element of the IT Acquisition competency model, how critical they believed the competency element to be in performing their current job, and how frequently they use that competency element. Each employee's supervisor was also asked to rate the proficiency of the employee for each element in the competency model and the criticality of the element to the employee's job. Behavioral descriptions for each competency element assisted the participant in selecting the most appropriate rating for each element. Each rating scale contained five usable ratings, enumerated one through five, and one rating of zero, which indicated that the employee or supervisor could not respond for this element and for this rating category (criticality, proficiency, or frequency). We excluded all zero ratings in calculating average response rates. The rating scales used are the following:

Criticality: How critical is this activity in your job? (Employee) / How critical is this behavior to the employee whom you are rating? (Supervisor)

0. N/A: Not needed in my job
1. Not Critical
2. Somewhat Critical
3. Fairly Critical
4. Very Critical
5. Extremely Critical

Proficiency: How proficient are you at the competency element behaviors? (Employee) / How proficient is the employee whom you are rating? (Supervisor)

0. No exposure to or awareness of this competency
1. Awareness
2. Basic
3. Intermediate
4. Advanced
5. Expert

Frequency: How often do you do this activity in your job? (Employee only)

0. Never: Not needed in my job
1. Almost Never
2. Rarely
3. Occasionally
4. Frequently
5. Very Frequently

Career level

We used the employees' responses to identify their current career levels (Entry, Journeyman, Senior) instead of basing their career levels on their certification levels.

Analysis of importance

We asked employees to rate the criticality and frequency of use of each IT Acquisition competency element against a standard five-point scale. We computed the mean of both ratings by competency, in order to assign relative importance. We categorized competencies as high, medium, or low, based on their mean criticality and frequency values. We also computed mean criticality and frequency ratings by career level and grouped them according to relative importance.

In order to determine how many competencies lie within each importance category (high, medium, or low) by workforce community, we plotted mean criticality against mean frequency ratings for the IT Acquisition workforce as a whole, and all service components and Fourth Estate agencies. Comparing high-importance competencies across the workforce communities allowed us to identify similarities and differences between them. Comparing mean criticality and frequency ratings across career levels within each workforce revealed the relative importance of competencies to each career level grouping.

We calculated the sample sizes for importance of each competency by counting respondents who provided reliable frequency and criticality responses at the competency element level. Eliminating responses using our validation criteria (outlined earlier) has the potential to reduce sample sizes for individual questions in the assessment.

Analysis of proficiency

We analyzed proficiency data received from respondents in the IT Acquisition workforce communities. First, we computed mean proficiency values for each competency by workforce and career level. Next, we plotted these values to get a sense of how the proficiencies progress by career level.

We compared mean proficiency levels across career levels to determine the reported proficiency status for each. We used the same process to remove incomplete/invalid data from our proficiency data set as we did for our importance analysis.

Section summary

Overall, 27 percent of the IT Acquisition workforce contributed to the assessment, completing 1,609 assessments. The low response rates from supervisors required us to use only employee responses for analysis. We use career level to examine the differences between competencies at various levels of performance in the IT Acquisition career field.

The methodology for analysis of the assessment data incorporated a reweighting system, which helped to negate the possibility of certain groups of individuals responding in different proportions to the assessment. Despite this, caution should still be exercised in extrapolating these results to represent the entire workforce. Also, extra care should be exercised in interpreting the 4th Estate results because of small sample sizes.

The methodologies for analysis of importance and proficiency are consistent with the other DoD Acquisition workforce analyses, and the rating scales used are identical.

Section 3: Workforce demographics

Respondents were asked 26 demographic and intentions questions. Supervisors were presented the same demographic questions when they responded as an employee, but provided no demographic input in their supervisory responses.

What follows helps create a profile of the IT Acquisition workforce, obtained from the demographic responses.[6] Demographics presented in this section represent the IT Acquisition workforce viewed as a whole. Component-specific demographics can be found in appendix L.

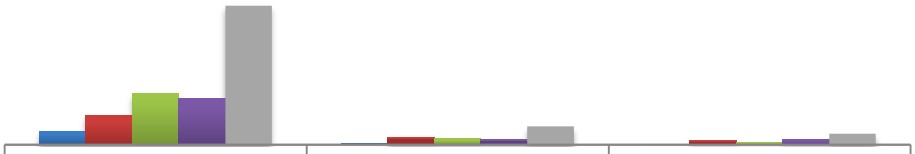
Identity

A large majority of the IT Acquisition workforce is most closely associated with the IT community and holds a 2210 Job/Series Code designation.

Members of the IT Acquisition workforce were asked to identify the community with which they are most closely associated. Respondents were given 13 career field options from within the overarching AT&L workforce. Figure 4 highlights that 75 percent of the IT Acquisition workforce, as a whole, is aligned in its identity. Interestingly, 10 percent are associated with Program Management (PM) and 6 percent with Test & Evaluation (T&E). Results were similar across components.

[6] Due to rounding, the column values shown do not always add to the column totals.

Figure 4. Reported IT Acquisition community association



	Information Technology	Program Management	Test and Evaluation
4th Estate	7%	1%	0%
Air Force	15%	4%	2%
Army	28%	3%	1%
Navy	25%	3%	3%
Grand Total	75%	10%	6%

n = 1590

To provide more depth to the issue of identity, workforce members were asked to select their Occupational/Job Code Series (see figure 5) from a listing of 34 occupational series options.[7] The majority of IT Acquisition members have a 2210 series code. The next two highest individual selections were 301 and 1550, respectively. As with community, results are similar across components, with minor differences that may be attributed to organizational structure.

[7] Job/Series selections were obtained from the Office of the Chief Information Officer.

Figure 5. Occupational/Job Code Series

Job/Code	4th Estate	Air Force	Army	Navy
2210	78%	68%	73%	79%
301	2%	5%	9%	1%
1550	0%	3%	3%	5%
343	3%	6%	0%	2%
391	3%	3%	3%	2%
854	3%	1%	2%	1%
855	0%	1%	1%	2%
335	0%	1%	0%	0%
340	0%	0%	0%	1%
346	0%	1%	1%	0%
801	3%	1%	1%	1%
856	0%	0%	0%	1%
1101	2%	2%	1%	0%
1515	0%	0%	0%	1%
1520	0%	0%	0%	1%
1910	2%	0%	0%	0%
2299	0%	0%	1%	0%
51A	1%	0%	1%	0%
63A	0%	1%	0%	0%
Other	1%	7%	2%	4%

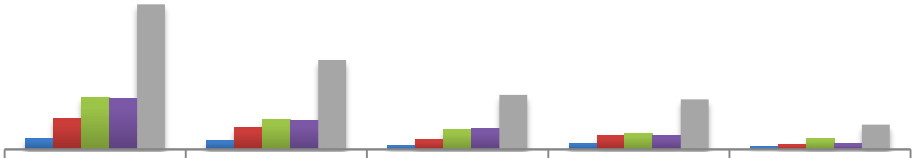
n = 1579

Experience

Almost half of IT Acquisition respondents have less than 5 years of IT Acquisition experience.

Results presented in figure 6 are derived from the following demographic question: *How many years of experience have you had in IT Acquisition?*

Figure 6. Reported years of IT Acquisition experience



	Less than 5 years	5 to 10 years	11 to 15 years	16 to 25 years	More than 25 years
4th Estate	3%	2%	1%	2%	1%
Air Force	9%	6%	3%	4%	1%
Army	14%	8%	5%	4%	3%
Navy	14%	8%	6%	4%	2%
Grand Total	40%	25%	15%	14%	7%

n = 1588

A plurality (40 percent) of the respondents have less than five years of IT Acquisition experience, with the Army and Navy representing a large portion of this sample segment (28 percent). Experience across the workforce is generally low, with 65 percent of respondents indicating less than 10 years.

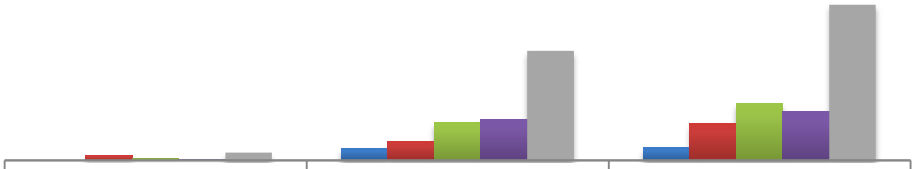
To explore experience a bit further, and to see whether perhaps the IT Acquisition workforce is made up of members who migrated from other career fields, we examined respondents' years of Federal experience, in general. We found that years of Federal experience closely mirrored years of IT Acquisition experience. The majority (61 percent) has less than 10 years of Federal experience. Forty-three percent have less than 5 years of experience. This tells us that, as a whole, the IT Acquisition workforce is relatively inexperienced in matters pertaining to Department of Defense IT Acquisition operations.

Military vs. civilian status

Most IT Acquisition respondents are federal civilians with prior military experience.

Results presented in figure 7 are derived from the following demographic question: *What is your current status?*

Figure 7. Reported military/civilian experience



	Active Duty Military	Federal Civilian - No Prior Military Service	Federal Civilian - Prior Military Service
4th Estate	0%	4%	5%
Air Force	2%	7%	14%
Army	1%	14%	21%
Navy	1%	15%	18%
Grand Total	3%	40%	57%

n = 1590

The vast majority (97 percent) of IT Acquisition respondents are Federal civilians, and more than half are Federal civilians with prior military experience. Among military respondents, the majority of those active duty service members that completed the assessment hold a rank of O4 or higher (57 percent) and are unsure of their future intent to continue within the Federal workforce upon completion of their active duty commitment (60 percent). See Appendix B for figures associated with military workforce members.

Most IT Acquisition participants are paid according to the GS-level pay scale and reside in the GS-11 to GS-13 grade level range.

Results are derived from the following demographic question: *If you are in the civil service (or Acq Demo) system, what is your current grade level (or pay-band)?*

A large majority of IT Acquisition civilian respondents are paid according to the GS-level pay scale (71 percent). Within the GS-level pay scale system, most civilian respondents fall in the GS-11 to GS-13 range (58 percent of respondents). Eleven percent reside within the Broadband III pay scale. Distribution across components is similar, as seen in Figure 8, except for the Army's higher percentage of "Broadband III" respondents and the Navy's higher percentage of "Other Pay Plan" respondents. Most Navy "other" plan respondents indicated that they were civilian, not active military members.

Figure 8. Reported pay bands within IT Acquisition

	Broadband II	Broadband III	Broadband IV	GS-10 or below	GS-11 to GS-13	GS-14 or higher	Other Pay Plan
4th Estate	0%	0%	0%	0%	6%	2%	0%
Air Force	0%	1%	0%	0%	17%	2%	1%
Army	1%	7%	3%	2%	19%	2%	2%
Navy	1%	3%	3%	1%	15%	4%	8%
Grand Total	2%	11%	6%	3%	58%	10%	11%

n = 1587

Most IT Acquisition participants do not support major acquisition programs with more than 50 percent of their time.

Results are derived from the following question: *If you are supporting a major program with more than 50 percent of your time, what is the acquisition category?*

The majority of respondents (56 percent) indicated, via a "not applicable" response, that they do not support a major acquisition program with more than 50 percent of their time. Those that do support major programs are similarly distributed among acquisition category (ACAT) I, II, and III programs. Comparable distributions exist across components. We recognize, however, that many of the 56 percent could be supporting other acquisition programs that are not ACAT I, II, and III programs.

Individuals supporting major acquisition programs with more than 50 percent of their time most often contribute to the operations and support phase of work.

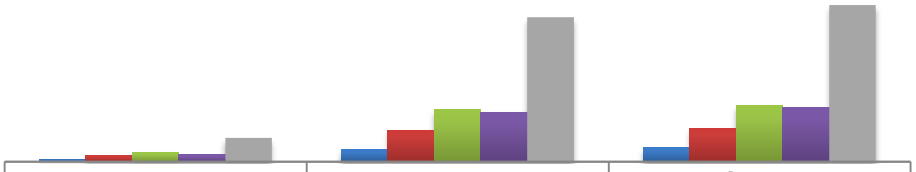
Those individuals who reported spending more than 50 percent of their time on major acquisition programs indicated, consistently across components and categories, that a majority of that time is spent within the operations and support phase of work.

Career level and certification level

The IT Acquisition workforce is almost equally divided between Senior and Journey career levels.

Results presented in figure 9 are derived from the following demographic question: *What is your current career level?*

Figure 9. Reported career levels within IT Acquisition



	Entry	Journey	Senior
4th Estate	1%	4%	4%
Air Force	2%	10%	10%
Army	3%	16%	17%
Navy	2%	15%	17%
Grand Total	7%	44%	48%

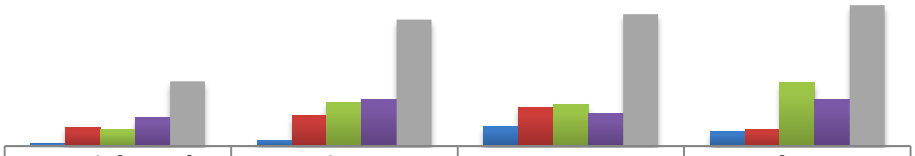
n = 1342

Just under half of the IT Acquisition participants indicated a career level of Senior (48 percent). Additionally, 44 percent of the workforce self-assessed at the Journeyman career level. The self-assessment of career level is closely distributed across components. The analyses in this report are described by career level in order to examine differences in competency importance and proficiency. The career level data are juxtaposed against the certification level, which is restricted to participants' Defense Acquisition Workforce Improvement Act (DAWIA) level. Human capital initiatives should take into account both; however, the competency analysis does not presume that certification level is equivalent to career level.

IT Acquisition respondents evenly divided among Certification Levels I, II, and III.

Results presented in figure 10 are derived from the following demographic question: *What is your current certification level?*

Figure 10. Reported certification levels within IT Acquisition



	Not Achieved	One	Two	Three
4th Estate	0%	1%	4%	3%
Air Force	4%	7%	8%	4%
Army	3%	9%	9%	14%
Navy	6%	10%	7%	10%
Grand Total	14%	27%	28%	30%

n = 1582

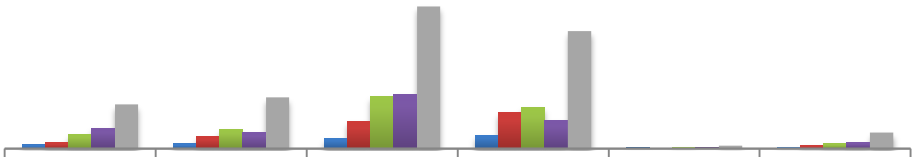
Certification levels of I, II, and III are very closely distributed across the IT Acquisition workforce with 27 percent, 28 percent, and 30 percent, respectively. Our analysis focuses on career level to examine the point in an IT Acquisition at which an employee's career competencies become most important.

Education

About three-fourths of IT Acquisition respondents have attained a bachelor's degree or higher.

Results presented in figure 11 are derived from the following demographic questions: *What is your highest level of educational attainment?*

Figure 11. Reported education levels within IT Acquisition



	High school diploma	Associate degree	Bachelors degree	Masters degree	Doctoral degree	Other
4th Estate	1%	1%	3%	4%	0%	0%
Air Force	2%	3%	7%	10%	0%	1%
Army	4%	5%	14%	11%	0%	1%
Navy	5%	4%	14%	7%	0%	2%
Grand Total	12%	14%	38%	31%	1%	4%

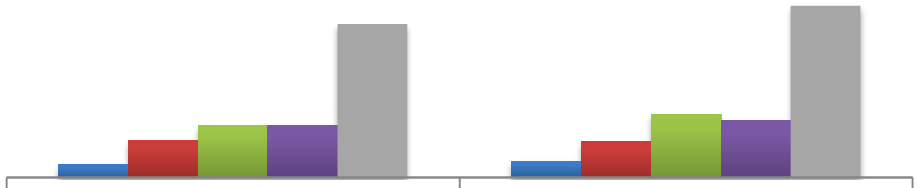
n = 1587

The highest level of educational achievement by most of the IT Acquisition respondents is bachelor's degree (38 percent); however, a large portion indicates a master's degree (31 percent). Fourth Estate respondents were most likely to have attained a bachelor's degree or higher.

Over half of the IT Acquisition respondents indicated that their highest level degree is in science, technology, engineering, or math (STEM).

Results presented in figure 12 are derived from the following demographic question: *Is your highest degree in science, technology, engineering, or math (STEM)?* Just over half of respondents indicate that their highest attained degree is in a STEM discipline. The proportions are similar for each component.

Figure 12. Reported STEM degrees



	No	Yes
4th Estate	4%	5%
Air Force	11%	11%
Army	16%	19%
Navy	16%	18%
Grand Total	47%	53%

n = 1577

Just as Army and Navy respondents were twice as likely as those in the Air Force to indicate a bachelor's degree as their highest degree, they were also nearly twice as likely to indicate their highest attained degree to be in a STEM discipline.

Other demographic and intentions data

Additional data were collected about assessment respondents. Some of these were used to inform our retirement and intentions analyses and will be discussed later.

Section summary

The responses we received to the demographic portion of the competency assessment provide insight into the composition of the IT Acquisition workforce.

Results indicate that most respondents have less than 10 years of IT Acquisition experience and less than 10 years of experience in the Federal workplace. The respondents are mostly Federal civilians with military experience and are primarily in the GS-11 to GS-13 grade level range.

About half of IT Acquisition respondents indicate that they are at the Senior career level. The majority of respondents have achieved a bachelor's degree or higher. IT Acquisition respondents mostly identified themselves with the overarching IT community and hold a 2210 job code.

In the next section, we evaluate the relative importance of competencies.

Section 4: Relative importance of competencies

Each assessment participant ranked the criticality and frequency of use for each of the 55 competency elements. We computed the mean criticality and the mean frequency of each competency, which we then used to assign relative importance.[8] We categorize competencies in terms of importance as follows:

- Competencies that have both a mean criticality rating AND a mean frequency rating of 3.0 or above have *high importance.*
- Competencies that have either a mean criticality rating OR a mean frequency rating of 3.0 or above have *medium importance.*
- Competencies that have both a mean criticality rating AND a mean frequency rating below 3.0 have *lower importance.*

In this section we discuss the relative importance of competencies for the IT Acquisition workforce as a whole. Next we address the importance of competencies across components.

Relative importance of competencies: IT Acquisition workforce

To get a baseline understanding of which competencies are important across IT Acquisitions, we compared the frequency and criticality of each competency to identify which competencies have high importance, medium importance, and low importance (as shown in table 2).

[8] Importance values and the accompanying discussion in this report reflect *perceived* importance, as indicated by the respondents to the assessment. One gap that the career field leadership may uncover is when competencies that they deem very important are not perceived as important by the workforce being assessed.

Table 2. Relative importance of competencies across IT Acquisition workforce

Unit		Competency	Entry			Journey			Senior		
			Freq.	Crit.	Imp.	Freq.	Crit.	Imp.	Freq.	Crit.	Imp.
Acquisition Planning	1	IT Legal, Policy, and Regulatory Environment	2.87	2.75		2.99	2.87		3.62	3.45	
	2	IT Acquisition Strategies and Approaches	2.28	2.43		2.66	2.59		3.19	3.18	
	3	Capital Planning and Investment Control (CPIC)	1.81	2.27		2.19	2.25		2.73	2.76	
	4	Business Case Analysis	2.27	2.31		2.29	2.35		2.96	2.97	
	5	Analysis of Alternatives (AoA)	2.53	2.29		2.45	2.44		2.92	2.99	
	6	Cost, Schedule and Performance Objectives	2.03	2.71		1.88	3.04		2.50	3.33	
	7	Capability Planning	2.96	2.21		3.71	2.44		3.57	2.85	
	8	Enterprise Architecture	2.26	2.48		2.17	2.35		2.66	2.80	
	9	Data Management	2.56	2.32		2.30	2.32		2.58	2.88	
	10	Software Development Methodologies and Paradigms	2.46	2.30		2.64	2.63		2.67	2.74	
	11	Deployment and Transition Planning	2.39	2.38		3.00	3.02		3.25	3.38	
	12	Continuous Process Improvement	2.31	2.51		2.84	2.75		3.30	3.22	
	13	Trade Studies	2.02	2.32		2.33	2.46		2.67	2.71	
	14	Requirements Management	2.75	2.82		3.21	3.21		3.58	3.70	
	15	IT Project/Program Oversight	2.72	2.70		2.76	2.89		3.33	3.45	
Program / Project Mgmt	16	Contracting for IT Systems	2.41	2.73		2.58	2.85		2.84	3.21	
	17	Best Practices	2.12	2.29		2.62	2.70		3.16	3.32	
	18	Software/Systems Cycle Management	2.45	2.84		2.68	2.91		2.99	3.24	
	19	Metrics and Measures	2.48	2.43		2.68	2.78		2.92	3.14	
	20	Risk Management	2.53	2.92		2.76	2.91		3.07	3.36	
	21	Earned Value Management (EVM)	1.91	2.52		2.21	2.42		2.27	2.66	
	22	Software Testing and Evaluation	2.52	2.91		2.77	3.09		2.69	3.17	
	23	Managing IT Investments as Portfolios	2.09	2.39		2.31	2.78		2.80	3.09	
Technical / System Mgmt	24	SW Quality Assurance (SQA)	2.50	2.69		2.93	2.97		2.56	2.99	
	25	Technical Reviews and Audits	2.46	2.93		3.03	3.08		3.06	3.33	
	26	Information Assurance/Cybersecurity	2.43	2.99		2.92	3.43		3.20	3.60	
	27	Software Development and Systems Engineering	2.86	3.05		2.89	3.14		3.17	3.38	
	28	Accessibility	2.31	2.95		1.94	2.46		2.21	2.64	
Professional	29	Partnering	2.98	3.13		3.08	3.09		3.75	3.69	
	30	Leading Change	2.64	2.93		2.74	3.05		3.42	3.61	
	31	Communication	3.33	3.13		3.38	3.42		3.88	3.85	
	32	Problem Solving	2.91	2.97		3.38	3.41		3.90	3.85	
	33	Strategic Thinking	2.87	3.07		3.20	3.30		3.68	3.73	
	34	Achievement Orientation	3.57	3.32		3.66	3.50		3.99	3.86	
	35	Accountability	3.62	3.48		3.85	3.65		4.21	4.10	
	36	Entrepreneurship	2.88	3.13		2.84	3.06		3.46	3.60	

Green shading indicates those competencies rated as highly important (frequency AND criticality >3.0). Yellow shading indicates competencies determined to be of medium importance (frequency OR criticality >3.0). Red shading indicates low importance competencies (frequency AND criticality <3.0).

All professional competencies are highly important to those individuals at the Senior career level.

Of the eight professional competencies evaluated, only the following three were deemed important across all IT Acquisition career levels:

- Communication

- Achievement Orientation
- Accountability

Accountability was determined to have the highest overall value of the measured professional competencies. The workforce scored this competency highest in both frequency and criticality. The data show that as individuals advance in career level, they place more importance on professional competencies. This emphasis lends insight into the types of competencies required to build, lead, and sustain a results-oriented culture.

Most technical competencies are of low importance to the Entry-level career field.

Those participants who self-assessed at the Entry career level indicate only one of the 28 technical competencies to be of medium importance: Software Development and Systems Engineering. All other technical competencies are considered to be of low importance in IT Acquisition work at the Entry career level. This finding triggered further analysis, across components, to determine whether importance values remained constant. As with the professional competencies, there is a positive, upward correlation with importance and career level within the IT Acquisition workforce.

Relative importance of competencies: Fourth Estate

In this section we discuss the relative importance of competencies within the Fourth Estate agencies, as shown in table 3.

Table 3. Relative Importance of competencies across the Fourth Estate

Unit		Competency	Entry			Journey			Senior		
			Freq.	Crit.	Imp.	Freq.	Crit.	Imp.	Freq.	Crit.	Imp.
Acquisition Planning	1	IT Legal, Policy, and Regulatory Environment	2.68	2.55		2.81	2.73		3.44	3.24	
	2	IT Acquisition Strategies and Approaches	1.93	2.45		2.35	2.28		3.05	2.89	
	3	Capital Planning and Investment Control (CPIC)	1.65	2.59		2.14	1.97		2.46	2.52	
	4	Business Case Analysis	2.09	2.26		1.98	1.92		2.84	2.73	
	5	Analysis of Alternatives (AoA)	2.26	1.74		2.29	2.21		2.94	2.85	
	6	Cost, Schedule and Performance Objectives	1.25	2.61		1.22	3.06		1.91	3.22	
	7	Capability Planning	3.12	1.67		4.89	2.11		3.70	2.37	
	8	Enterprise Architecture	2.00	2.47		1.75	2.19		2.20	2.41	
	9	Data Management	2.72	2.72		2.32	2.35		2.18	2.80	
	10	Software Development Methodologies and Paradigms	2.58	2.26		3.16	2.91		2.80	2.92	
	11	Deployment and Transition Planning	1.99	2.15		3.04	2.94		3.35	3.46	
	12	Continuous Process Improvement	2.36	2.76		3.05	2.88		3.28	3.25	
	13	Trade Studies	1.00	2.00		2.44	2.53		2.60	2.56	
	14	Requirements Management	2.43	2.71		3.29	3.17		3.51	3.66	
	15	IT Project/Program Oversight	2.67	2.83		2.74	2.95		3.25	3.29	
Program / Project Mgmt	16	Contracting for IT Systems	2.47	2.93		2.77	2.96		2.91	3.23	
	17	Best Practices	2.00	2.26		2.38	2.46		2.97	3.13	
	18	Software/Systems Cycle Management	2.34	2.95		3.07	3.04		2.97	3.09	
	19	Metrics and Measures	2.36	2.37		3.29	3.10		2.88	3.15	
	20	Risk Management	2.53	3.15		3.28	3.14		3.15	3.41	
	21	Earned Value Management (EVM)	1.79	2.74		2.96	2.95		2.29	2.55	
	22	Software Testing and Evaluation	2.33	3.14		3.05	3.23		2.73	3.04	
	23	Managing IT Investments as Portfolios	1.74	2.26		2.65	2.88		2.47	2.72	
Technical / System Mgmt	24	SW Quality Assurance (SQA)	2.67	3.00		3.96	3.73		2.51	2.87	
	25	Technical Reviews and Audits	2.52	3.33		3.79	3.51		3.13	3.33	
	26	Information Assurance/Cybersecurity	1.99	3.38		2.69	3.16		2.82	3.17	
	27	Software Development and Systems Engineering	3.03	3.50		3.28	3.39		3.02	3.17	
	28	Accessibility	1.92	3.30		1.78	2.24		2.09	2.24	
Professional	29	Partnering	2.78	3.11		2.84	2.90		3.73	3.52	
	30	Leading Change	2.74	3.04		2.77	2.95		3.29	3.34	
	31	Communication	3.69	3.43		3.45	3.37		3.84	3.81	
	32	Problem Solving	2.84	3.08		3.31	3.40		3.69	3.79	
	33	Strategic Thinking	2.85	3.23		3.20	3.36		3.38	3.45	
	34	Achievement Orientation	3.89	3.60		3.54	3.49		3.85	3.72	
	35	Accountability	3.65	3.65		3.79	3.65		4.18	4.13	
	36	Entrepreneurship	2.67	3.15		2.93	3.13		3.35	3.35	

Green shading indicates those competencies rated as highly important (frequency AND criticality >3.0). Yellow shading indicates competencies determined to be of medium importance (frequency OR criticality >3.0). Red shading indicates low importance competencies (frequency AND criticality <3.0).

All professional competencies are highly important to those at the Senior career level.

Similar to the IT Acquisition workforce as a whole (shown in table 2), all professional competencies are important to those at Senior career level for the Fourth Estate. With mean scores above 4.0,

Accountability is the highest professional competency, indicating that it is used frequently and is very critical to the IT Acquisition role. Two professional competencies were determined to be highly important across career levels:

- Achievement Orientation
- Accountability

Interesting to note, no professional competencies were determined to be of low importance within the Entry career level; this finding is unique to Fourth Estate agencies. Only Partnering and Leading Change at the Journey career level were shown to be of low importance.

The Technical/System Management Unit, by percentage, has the most technical competencies reported to be of high importance.

Within the Technical/System Management Unit of competence, across career levels, 30 percent of measured competencies are of high importance. All but one, SW Quality Assurance, indicate medium or high levels.

Relative importance of competencies: Air Force

In this section we discuss the relative importance of competencies within the U. S. Air Force, as shown in table 4.

Table 4. Relative importance of competencies across Air Force

Unit		Competency	Entry			Journey			Senior		
			Freq.	Crit.	Imp.	Freq.	Crit.	Imp.	Freq.	Crit.	Imp.
Acquisition Planning	1	IT Legal, Policy, and Regulatory Environment	2.50	2.43		3.16	2.99		3.80	3.60	
	2	IT Acquisition Strategies and Approaches	2.31	2.04		2.95	2.84		3.39	3.48	
	3	Capital Planning and Investment Control (CPIC)	2.00	2.00		2.32	2.43		2.98	3.07	
	4	Business Case Analysis	1.91	1.92		2.44	2.60		3.02	3.11	
	5	Analysis of Alternatives (AoA)	2.27	2.27		2.66	2.57		2.90	3.06	
	6	Cost, Schedule and Performance Objectives	2.82	2.00		1.99	3.34		2.86	3.46	
	7	Capability Planning	2.00	2.31		3.78	2.62		3.53	3.08	
	8	Enterprise Architecture	1.73	1.91		2.26	2.32		2.93	2.99	
	9	Data Management	2.27	2.09		2.10	2.23		2.78	3.00	
	10	Software Development Methodologies and Paradigms	1.86	2.00		2.37	2.47		2.60	2.67	
	11	Deployment and Transition Planning	2.20	2.00		3.28	3.25		3.32	3.44	
	12	Continuous Process Improvement	2.45	2.15		2.78	2.63		3.49	3.37	
	13	Trade Studies	2.00	1.67		2.37	2.46		2.76	2.73	
	14	Requirements Management	2.93	2.60		3.21	3.29		3.72	3.89	
	15	IT Project/Program Oversight	2.22	2.00		2.88	2.94		3.69	3.75	
Program / Project Mgmt	16	Contracting for IT Systems	1.77	1.82		2.67	3.03		2.96	3.42	
	17	Best Practices	2.10	1.60		2.82	2.81		3.37	3.61	
	18	Software/Systems Cycle Management	2.00	2.00		2.52	2.96		3.13	3.50	
	19	Metrics and Measures	2.17	2.06		2.57	2.69		3.11	3.36	
	20	Risk Management	2.13	1.89		2.52	2.84		3.15	3.55	
	21	Earned Value Management (EVM)	1.20	1.67		1.79	2.08		2.29	2.83	
	22	Software Testing and Evaluation	1.74	1.83		2.73	3.22		2.61	3.28	
	23	Managing IT Investments as Portfolios	2.00	1.86		2.22	2.84		3.10	3.48	
Technical / System Mgmt	24	SW Quality Assurance (SQA)	1.90	1.90		2.37	2.57		2.67	3.22	
	25	Technical Reviews and Audits	1.75	1.50		2.80	3.02		3.13	3.50	
	26	Information Assurance/Cybersecurity	2.38	2.13		2.93	3.65		3.43	3.86	
	27	Software Development and Systems Engineering	2.00	1.69		2.74	3.20		3.38	3.65	
	28	Accessibility	2.50	2.33		1.86	2.25		2.23	2.87	
Professional	29	Partnering	2.82	2.64		3.03	3.07		3.94	3.94	
	30	Leading Change	2.30	2.50		2.71	3.15		3.63	3.81	
	31	Communication	2.75	2.50		3.32	3.53		4.04	3.95	
	32	Problem Solving	2.91	2.73		3.43	3.43		4.12	3.95	
	33	Strategic Thinking	2.64	2.55		3.42	3.40		4.00	4.02	
	34	Achievement Orientation	3.75	3.54		3.72	3.41		4.13	4.00	
	35	Accountability	3.81	3.44		3.85	3.62		4.32	4.18	
	36	Entrepreneurship	2.64	2.52		2.77	2.94		3.69	3.77	

Green shading indicates those competencies rated as highly important (frequency AND criticality >3.0). Yellow shading indicates competencies determined to be of medium importance (frequency OR criticality >3.0). Red shading indicates low importance competencies (frequency AND criticality <3.0).

All professional competencies are highly important to those at the Senior career level.

Similar to the IT Acquisition workforce as a whole (shown in table 2), all professional competencies are important to those at the Senior career level for the Air Force. With mean scores above 4.0, Accountability is the highest professional competency, indicating that it is used

frequently and is very critical to the IT Acquisition role. Two professional competencies were determined to be highly important across career levels:

- Achievement Orientation
- Accountability

Only Achievement Orientation and Accountability were shown to have a value other than low importance within the Entry career level. In fact, all other professional and technical competencies measured in the Entry level were determined to be of low importance.

Approximately 65 percent of all competencies are highly important to those at the Senior career level.

The Air Force, at the Senior career level, indicates the greatest percentage of highly important professional and technical competencies combined.

Relative importance of competencies: Army

In this section, we discuss the relative importance of competencies within the U. S. Army, as shown in table 5.

Table 5. Relative importance of competencies across Army

Unit		Competency	Entry			Journey			Senior		
			Freq.	Crit.	Imp.	Freq.	Crit.	Imp.	Freq.	Crit.	Imp.
Acquisition Planning	1	IT Legal, Policy, and Regulatory Environment	2.83	2.63		2.82	2.82		3.52	3.32	
	2	IT Acquisition Strategies and Approaches	2.67	2.42		2.56	2.51		3.00	2.92	
	3	Capital Planning and Investment Control (CPIC)	2.08	2.19		2.12	2.25		2.58	2.43	
	4	Business Case Analysis	2.42	2.34		2.28	2.34		2.94	2.75	
	5	Analysis of Alternatives (AoA)	2.50	2.47		2.32	2.44		3.03	2.87	
	6	Cost, Schedule and Performance Objectives	2.39	2.60		2.11	2.72		2.47	3.10	
	7	Capability Planning	2.87	2.17		3.05	2.46		3.47	2.71	
	8	Enterprise Architecture	1.60	1.81		2.13	2.38		2.48	2.60	
	9	Data Management	2.26	1.85		2.21	2.26		2.51	2.81	
	10	Software Development Methodologies and Paradigms	2.68	2.48		2.31	2.42		2.58	2.55	
	11	Deployment and Transition Planning	2.79	2.45		2.79	2.91		3.22	3.20	
	12	Continuous Process Improvement	2.56	2.65		2.66	2.75		3.11	3.02	
	13	Trade Studies	1.95	2.12		2.18	2.35		2.50	2.59	
	14	Requirements Management	3.14	3.11		3.21	3.27		3.44	3.49	
	15	IT Project/Program Oversight	2.52	2.40		2.70	2.91		2.88	3.16	
Program / Project Mgmt	16	Contracting for IT Systems	2.34	2.65		2.32	2.58		2.62	2.91	
	17	Best Practices	2.06	2.42		2.51	2.66		2.84	3.00	
	18	Software/Systems Cycle Management	2.85	2.94		2.43	2.71		2.81	2.97	
	19	Metrics and Measures	2.14	2.21		2.29	2.58		2.70	2.85	
	20	Risk Management	2.46	2.65		2.48	2.80		2.89	3.13	
	21	Earned Value Management (EVM)	1.64	1.85		1.88	2.15		2.25	2.59	
	22	Software Testing and Evaluation	2.71	2.62		2.63	2.92		2.73	3.08	
	23	Managing IT Investments as Portfolios	1.86	1.78		2.16	2.69		2.57	2.87	
Technical / System Mgmt	24	SW Quality Assurance (SQA)	1.99	2.05		2.36	2.66		2.58	2.83	
	25	Technical Reviews and Audits	2.39	2.42		2.36	2.74		2.90	3.04	
	26	Information Assurance/Cybersecurity	2.96	2.99		2.93	3.34		2.91	3.46	
	27	Software Development and Systems Engineering	2.65	2.72		2.59	2.87		2.87	3.16	
	28	Accessibility	2.24	2.32		2.10	2.68		2.23	2.76	
Professional	29	Partnering	3.36	3.29		2.95	3.01		3.52	3.50	
	30	Leading Change	2.54	2.88		2.65	2.92		3.14	3.47	
	31	Communication	3.13	3.11		3.35	3.34		3.68	3.72	
	32	Problem Solving	3.06	3.13		3.36	3.32		3.73	3.76	
	33	Strategic Thinking	2.59	2.62		3.04	3.18		3.50	3.59	
	34	Achievement Orientation	3.25	2.97		3.69	3.50		3.91	3.85	
	35	Accountability	3.45	3.16		3.83	3.67		4.11	4.02	
	36	Entrepreneurship	3.09	3.30		2.78	3.01		3.27	3.53	

Relative Green shading indicates those competencies rated as highly important (frequency AND criticality >3.0). Yellow shading indicates competencies determined to be of medium importance (frequency OR criticality >3.0). Red shading indicates low importance competencies (frequency AND criticality <3.0).

All professional competencies are highly important to those at the Senior career level.

Similar to the IT Acquisition workforce as a whole (shown in table 2), all professional competencies are important to those at the Senior career level for the Army. With mean scores above 4.0, Accountability is

the highest professional competency, indicating that is used frequently and is very critical to the IT Acquisition role. Three professional competencies were determined to be highly important across career levels:

- Accountability
- Problem Solving
- Communication

Interestingly, the Army, along with Navy, has the highest percentage, across career levels, of professional competencies determined to be of high importance. It would be interesting to explore these components' leadership development programs to trace professional competencies across one's career; wide exposure could be one explanation for the large number of high values.

Requirements Management is highly important across career levels.

The only technical competency determined to be highly important across career fields is Requirements Management. Only four of 28 technical competencies were determined to be of high importance at the Senior career level. This is the lowest number found within any single component.

Relative importance of competencies: Navy

In this section we discuss the relative importance of competencies within the U.S. Navy, as shown in table 6.

Table 6. Relative importance of competencies across Navy

Unit		Competency	Entry			Journey			Senior		
			Freq.	Crit.	Imp.	Freq.	Crit.	Imp.	Freq.	Crit.	Imp.
Acquisition Planning	1	IT Legal, Policy, and Regulatory Environment	3.34	3.25		3.09	2.93		3.53	3.46	
	2	IT Acquisition Strategies and Approaches	2.64	2.56		2.67	2.65		3.10	3.10	
	3	Capital Planning and Investment Control (CPIC)	1.85	2.06		2.09	2.29		2.60	2.67	
	4	Business Case Analysis	2.65	2.56		2.35	2.39		2.97	3.09	
	5	Analysis of Alternatives (AoA)	3.06	3.04		2.48	2.54		2.87	3.06	
	6	Cost, Schedule and Performance Objectives	3.15	3.27		2.46	2.82		2.41	3.35	
	7	Capability Planning	3.26	3.06		2.95	2.48		3.58	2.95	
	8	Enterprise Architecture	2.99	3.02		2.48	2.55		2.71	2.93	
	9	Data Management	2.66	2.20		2.60	2.48		2.62	2.77	
	10	Software Development Methodologies and Paradigms	2.34	2.36		2.55	2.62		2.72	2.82	
	11	Deployment and Transition Planning	2.81	2.81		2.72	2.89		3.06	3.30	
	12	Continuous Process Improvement	2.06	2.16		2.78	2.75		3.12	3.05	
	13	Trade Studies	2.80	2.84		2.25	2.48		2.65	2.87	
	14	Requirements Management	3.18	3.00		3.10	3.10		3.47	3.54	
	15	IT Project/Program Oversight	3.20	3.17		2.62	2.73		3.02	3.24	
Program / Project Mgmt	16	Contracting for IT Systems	2.70	2.78		2.43	2.66		2.67	3.00	
	17	Best Practices	2.48	2.73		2.69	2.89		3.14	3.15	
	18	Software/Systems Cycle Management	2.75	2.84		2.55	2.81		2.86	3.10	
	19	Metrics and Measures	3.29	3.03		2.26	2.62		2.75	2.92	
	20	Risk Management	2.83	3.08		2.61	2.80		2.97	3.15	
	21	Earned Value Management (EVM)	2.63	2.68		1.87	2.31		2.21	2.53	
	22	Software Testing and Evaluation	3.18	2.96		2.50	2.83		2.75	3.16	
	23	Managing IT Investments as Portfolios	3.22	3.33		2.17	2.65		2.73	2.91	
Technical / System Mgmt	24	SW Quality Assurance (SQA)	2.58	2.54		2.49	2.75		2.39	2.80	
	25	Technical Reviews and Audits	2.51	2.60		2.59	2.77		2.98	3.23	
	26	Information Assurance/Cybersecurity	2.72	2.82		3.13	3.43		3.33	3.65	
	27	Software Development and Systems Engineering	2.95	2.69		2.84	2.96		3.13	3.25	
	28	Accessibility	2.85	2.94		2.10	2.76		2.28	2.60	
Professional	29	Partnering	3.32	3.35		3.56	3.41		3.58	3.56	
	30	Leading Change	2.60	2.89		2.83	3.13		3.34	3.59	
	31	Communication	2.94	2.75		3.39	3.40		3.77	3.81	
	32	Problem Solving	2.94	2.71		3.42	3.45		3.84	3.82	
	33	Strategic Thinking	3.25	3.22		3.02	3.19		3.54	3.61	
	34	Achievement Orientation	2.99	2.87		3.72	3.67		3.91	3.77	
	35	Accountability	3.64	3.41		3.93	3.67		4.11	3.99	
	36	Entrepreneurship	3.34	3.27		2.88	3.20		3.31	3.58	

Green shading indicates those competencies rated as highly important (frequency AND criticality >3.0). Yellow shading indicates competencies determined to be of medium importance (frequency OR criticality >3.0). Red shading indicates low importance competencies (frequency AND criticality <3.0).

All professional competencies are highly important to those at the Senior career level.

Similar to the IT Acquisition workforce as a whole (shown in table 2), all professional competencies are important to those at the Senior

career level for the Navy. Three professional competencies were determined to be highly important across career levels:

- Partnering
- Strategic Thinking
- Accountability

The Navy, along with the Army, has the highest percentage, across career levels, of professional competencies determined to be of high importance.

While there were no technical competencies indicative of high importance across career levels, Requirements Management did indicate medium importance within Entry-level parameters and high importance with those at the Journey and Senior career levels. Interestingly, the Navy is the only component that indicates a "bathtub effect" with its technical competencies. That is, the Journeyman career level indicates more low importance competencies than do Entry and Senior career levels. We recommend that the IT Acquisition community explore further the roles and responsibilities of those residing at the Journey career level.

Section summary

Within the Acquisition Planning unit of competence, only three technical competencies, IT Legal, Policy, and Regulatory Environment, Capability Planning, and Requirements Management are reported to be used more than occasionally. Interestingly, Capability Planning is used most frequently yet is reported at a relatively lower critical value than most other technical competencies. Generally, Program/Project Management and Technical/System Management competencies are more critical to the workforce than those associated with Acquisition Planning.

When we evaluate competencies, in aggregate form, across components and across career levels, only two technical competencies are determined to be highly important (frequency <u>and</u> criticality measured at 3.0 or above): IT Legal, Policy, and Regulatory Environment; and Requirements Management (both within the Acquisition Planning unit of competence).

Examining the relative importance of competencies across the IT Acquisition workforce, we found professional competencies to be highly important across most of the workforce, steadily progressing upwards along with career level (table 7). Three professional competencies were found to be highly important across IT Acquisition career levels:

- Communication
- Achievement Orientation
- Accountability.

We found no technical competencies to be highly important across career levels within the IT Acquisition workforce. Several were reported highly important across two of three career levels:

- Deployment and Transition Planning
- Requirements Management
- Technical Reviews and Audits

Accountability was the competency that had the highest reported values in frequency and criticality in the workforce as a whole, and in each component. See appendix K for a comparative map of importance across component workforces.

When examining competencies by component, we found similar results. Across workforces at the Entry level, few technical competencies are seen as important. The Navy shows the highest support for technical competencies at this career level, with 21 percent reported to be highly important.

The Army workforce tended to rate the technical competencies lower in importance than did the other workforces; only 23 percent rated technical competencies at or above medium importance. Other components indicated higher support for the technical aspect of the model: Fourth Estate = 48 percent; Air Force = 60 percent; Navy = 61percent.

Table 7. Relative importance of competencies across IT Acquisition workforce

Unit		Competency	IT Acq. Workforce
Acquisition Planning	1	IT Legal, Policy, and Regulatory Environment	
	2	IT Acquisition Strategies and Approaches	
	3	Capital Planning and Investment Control (CPIC)	
	4	Business Case Analysis	
	5	Analysis of Alternatives (AoA)	
	6	Cost, Schedule and Performance Objectives	
	7	Capability Planning	
	8	Enterprise Architecture	
	9	Data Management	
	10	Software Development Methodologies and Paradigms	
	11	Deployment and Transition Planning	
	12	Continuous Process Improvement	
	13	Trade Studies	
	14	Requirements Management	
	15	IT Project/Program Oversight	
Program / Project Mgmt	16	Contracting for IT Systems	
	17	Best Practices	
	18	Software/Systems Cycle Management	
	19	Metrics and Measures	
	20	Risk Management	
	21	Earned Value Management (EVM)	
	22	Software Testing and Evaluation	
	23	Managing IT Investments as Portfolios	
Technical / System Mgmt	24	SW Quality Assurance (SQA)	
	25	Technical Reviews and Audits	
	26	Information Assurance/Cybersecurity	
	27	Software Development and Systems Engineering	
	28	Accessibility	
Professional	29	Partnering	
	30	Leading Change	
	31	Communication	
	32	Problem Solving	
	33	Strategic Thinking	
	34	Achievement Orientation	
	35	Accountability	
	36	Entrepreneurship	

Green shading indicates those competencies rated as highly important (frequency AND criticality >3.0). Yellow shading indicates competencies determined to be of medium importance (frequency OR criticality >3.0). Red shading indicates low importance competencies (frequency AND criticality <3.0).

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Section 5: Proficiency ratings

In this section, we present the average proficiency ratings provided by assessment participants for all competencies in the IT Acquisition Workforce Competency Model. In order to develop a meaningful representation of the data, we used a three-step process to assess the reported proficiency levels:

1. Calculate an average for *each* of the 36 competencies, *across* the career levels.
2. Calculate a grand average separately for the 28 technical competencies, the eight professional competencies, and the entire model of 36 competencies *within* each reported career level and across the workforce.
3. Assess the reported proficiency values against the calculated grand averages in order to determine those areas in which the workforce may be considered to demonstrate "above average" proficiency.

We review the workforce's proficiency in both technical and professional competencies. As indicated in the previous section, very few technical competencies have been determined to be highly important across career levels. To assess and report proficiency in a way that is meaningful to IT Acquisition leadership, this analysis section assumes that if two of three career levels report high importance, the competency is considered highly important for workforce planning purposes.

We display our results for the entire IT Acquisition workforce by career level and then by each component at the career level. We finish our discussion by highlighting the proficiency of the highly important competencies.

Proficiency by career level: IT Acquisition workforce

Across career level, proficiency ratings trend higher.

For all competencies, the IT Acquisition workforce reports steady increases in proficiency that correlate with increased career level.

The workforce as a whole demonstrates basic to intermediate *technical* competence and intermediate to advanced *professional* competence.

For IT Acquisition as a whole, three technical competencies and six professional competencies were determined to be highly important, for proficiency analysis, across career levels (table 8 and highlighted in yellow in table 9). Of the three technical competencies, only Requirements Management indicated a mean rating above 3.0 (intermediate proficiency). However, all of the professional competencies were reported to have values above 3.0, indicating that the workforce demonstrates *at least* an intermediate proficiency level in tasks requiring professional competence.

Table 8. Highly important competencies for IT Acquisition proficiency analysis

Technical Competencies	Professional Competencies	
• Deployment and Transition Planning • Requirements Management • Technical Reviews and Audits	• Partnering • Communication • Problem Solving	• Strategic Thinking • Achievement Orientation • Accountability

Table 8 shows competencies considered to be highly important by at least two of the three defined career levels.

To assist the reader in visualizing the data, a progression line has been incorporated (as shown in table 10, "*IT Acq. Progression*") which graphically depicts the growth of proficiency across career levels. For example, "IT Legal Policy, and Regulatory Environment" progresses linearly across career levels; in contrast, "Analysis of Alternatives (AoA)" remains about the same proficiency at Entry and Journey levels, but increases at the Senior level.

Table 9. Mean proficiency for IT Acquisition

Unit		Competency	IT Acquisition				
			IT WF	Entry	Journey	Senior	IT Acq. Progression
Acquisition Planning	1	IT Legal, Policy, and Regulatory Environment	2.91	2.11	2.97	3.65	
	2	IT Acquisition Strategies and Approaches	2.72	2.01	2.67	3.49	
	3	Capital Planning and Investment Control (CPIC)	2.32	1.71	2.25	2.99	
	4	Business Case Analysis	2.53	1.95	2.40	3.25	
	5	Analysis of Alternatives (AoA)	2.51	2.32	2.32	2.88	
	6	Cost, Schedule and Performance Objectives	2.86	2.22	2.80	3.54	
	7	Capability Planning	2.49	2.02	2.38	3.09	
	8	Enterprise Architecture	2.41	1.97	2.35	2.92	
	9	Data Management	2.71	2.28	2.64	3.22	
	10	Software Development Methodologies and Paradigms	2.69	2.27	2.78	3.01	
	11	Deployment and Transition Planning	2.95	2.32	2.97	3.56	
	12	Continuous Process Improvement	2.75	1.98	2.79	3.47	
	13	Trade Studies	2.58	2.23	2.45	3.06	
	14	Requirements Management	3.10	2.34	3.12	3.84	
	15	IT Project/Program Oversight	2.99	2.43	2.85	3.68	
Program / Project Mgmt	16	Contracting for IT Systems	2.69	2.24	2.55	3.29	
	17	Best Practices	2.87	2.31	2.71	3.59	
	18	Software/Systems Cycle Management	2.82	2.15	2.80	3.52	
	19	Metrics and Measures	2.79	2.30	2.73	3.35	
	20	Risk Management	2.84	2.18	2.81	3.53	
	21	Earned Value Management (EVM)	2.32	1.95	2.32	2.69	
	22	Software Testing and Evaluation	2.79	2.28	2.89	3.19	
	23	Managing IT Investments as Portfolios	2.54	2.02	2.50	3.11	
Technical / System Mgmt	24	SW Quality Assurance (SQA)	2.71	2.25	2.85	3.02	
	25	Technical Reviews and Audits	2.90	2.27	2.98	3.45	
	26	Information Assurance/Cybersecurity	2.75	2.22	2.74	3.30	
	27	Software Development and Systems Engineering	2.81	2.18	2.78	3.47	
	28	Accessibility	2.41	2.30	2.31	2.63	
Professional	29	Partnering	3.22	2.71	3.11	3.83	
	30	Leading Change	3.03	2.48	2.90	3.71	
	31	Communication	3.45	2.86	3.43	4.07	
	32	Problem Solving	3.46	2.75	3.50	4.13	
	33	Strategic Thinking	3.36	2.90	3.27	3.91	
	34	Achievement Orientation	3.69	3.33	3.59	4.13	
	35	Accountability	3.75	3.34	3.65	4.27	
	36	Entrepreneurship	3.24	2.71	3.11	3.91	
		Technical:	**2.71**	**2.17**	**2.67**	**3.28**	
		Professional:	**3.40**	**2.88**	**3.32**	**4.00**	
		Grand Average:	**2.86**	**2.33**	**2.81**	**3.44**	

Yellow shaded competencies are those competencies considered to be highly important by at least two of the three defined career levels. Green shaded numerical values are those areas in which the workforce reported proficiency levels above the relative career level's calculated Grand Average. Competency values indicate relative proficiency, as reported by respondents: <2 = Awareness; 2 to 3 = Basic to Intermediate; 3 to 4 = Intermediate to Advanced; >4 = Advanced to Expert proficiency. Progression line shows graphic pattern of proficiency across career levels.

We summarize the mean proficiency results of the high-importance competencies as rated by IT Acquisition respondents:

- Entry – Mean proficiency ratings are between 2.0 (basic) and 3.0 (intermediate) for three of three high-importance technical competencies and between 2.0 (basic) and 3.0 (intermediate) for four of six professional competencies.
- Journeyman – Mean proficiency ratings are between 2.0 (basic) and 3.0 (intermediate) for two of three high-importance technical competencies and between 3.0 (intermediate) and 4.0 (advanced) for six of six professional competencies.
- Senior – Mean proficiency ratings are between 3.0 (intermediate) and 4.0 (advanced) for three of three high-importance technical competencies and between 4.0 (advanced) and 5.0 (expert) for four of six professional competencies.

The IT Acquisition workforce, as a whole, does not reveal gaps in proficiency when comparing those competencies viewed as highly important with the measured grand average. However, four competencies had, in Phase II, been identified by IT Acquisition leadership and SMEs as being associated with superior performance. These competencies are IT Acquisition Strategies and Approaches, Risk Management, Best Practices, and Contracting. Gaps exist between how Entry and Journeyman assessment respondents perceived the importance of these competencies and how leadership and SMEs perceived the importance of these competencies.

Proficiency by career level: Fourth Estate

Across career levels, proficiency ratings trend higher.

For a large majority of competencies, the Fourth Estate workforce reports steady increases in proficiency that correlate with increased career level.

Fourth Estate IT Acquisition, as a whole, generally demonstrates basic to intermediate *technical* competence and intermediate to advanced *professional* competence.

For Fourth Estate as a whole, four technical competencies and six professional competencies were determined to be highly important

across career levels (table 10 and highlighted in table 11). Of the four technical competencies, only Technical Review and Audits indicated a mean rating above 3.0 (intermediate proficiency). However, all professional competencies were reported to have values above 3.0, indicating that the workforce demonstrates *at least* an intermediate proficiency level in tasks requiring professional competence.

Table 10 Highly important competencies for Fourth Estate proficiency analysis

Technical Competencies	Professional Competencies	
• Requirements Management • Risk Management • Technical Reviews and Audits • Software Development and Systems Engineering	• Partnering • Communication • Problem Solving	• Strategic Thinking • Achievement Orientation • Accountability

Table 10 shows competencies considered to be highly important by at least two of the three defined career levels.

We summarize the mean proficiency results of the high-importance competencies as rated by Fourth Estate respondents:

- Entry – Mean proficiency ratings are between 2.0 (basic) and 3.0 (intermediate) for four of four high-importance technical competencies and between 3.0 (intermediate) and 4.0 (advanced) for three of six professional competencies.
- Journeyman – Mean proficiency ratings are between 3.0 (intermediate) and 4.0 (advanced) for two of four high-importance technical competencies and between 3.0 (intermediate) and 4.0 (advanced) for six of six professional competencies.
- Senior – Mean proficiency ratings are between 3.0 (intermediate) and 4.0 (advanced) for four of four high-importance technical competencies and between 4.0 (advanced) and 5.0 (expert) for four of six professional competencies.

Table 11. Mean proficiency for the Fourth Estate

Unit		Competency	4th Estate				
			4th WF	Entry	Journey	Senior	4th Estate Progression
Acquisition Planning	1	IT Legal, Policy, and Regulatory Environment	2.74	1.91	2.87	3.44	
	2	IT Acquisition Strategies and Approaches	2.54	1.75	2.57	3.29	
	3	Capital Planning and Investment Control (CPIC)	2.23	1.62	2.16	2.91	
	4	Business Case Analysis	2.43	1.91	2.23	3.14	
	5	Analysis of Alternatives (AoA)	2.62	2.72	2.35	2.80	
	6	Cost, Schedule and Performance Objectives	2.80	2.17	2.80	3.44	
	7	Capability Planning	2.25	1.67	2.22	2.85	
	8	Enterprise Architecture	2.43	2.30	2.21	2.77	
	9	Data Management	2.63	2.26	2.44	3.17	
	10	Software Development Methodologies and Paradigms	2.87	2.53	3.05	3.05	
	11	Deployment and Transition Planning	2.91	2.21	2.97	3.54	
	12	Continuous Process Improvement	2.84	2.06	2.91	3.56	
	13	Trade Studies	2.69	2.56	2.56	2.96	
	14	Requirements Management	2.97	2.22	3.03	3.65	
	15	IT Project/Program Oversight	3.08	2.67	2.94	3.62	
Program / Project Mgmt	16	Contracting for IT Systems	2.83	2.55	2.62	3.32	
	17	Best Practices	2.84	2.47	2.57	3.50	
	18	Software/Systems Cycle Management	2.83	2.10	2.88	3.51	
	19	Metrics and Measures	2.87	2.25	3.06	3.30	
	20	Risk Management	2.88	2.07	2.98	3.59	
	21	Earned Value Management (EVM)	2.41	2.00	2.47	2.76	
	22	Software Testing and Evaluation	2.82	2.27	3.03	3.15	
	23	Managing IT Investments as Portfolios	2.39	1.74	2.53	2.90	
Technical / System Mgmt	24	SW Quality Assurance (SQA)	3.01	2.51	3.46	3.06	
	25	Technical Reviews and Audits	3.15	2.43	3.45	3.57	
	26	Information Assurance/Cybersecurity	2.57	2.22	2.43	3.04	
	27	Software Development and Systems Engineering	2.80	2.21	2.86	3.34	
	28	Accessibility	2.43	2.62	2.18	2.49	
Professional	29	Partnering	3.30	2.68	3.27	3.96	
	30	Leading Change	3.09	2.61	2.98	3.68	
	31	Communication	3.55	2.93	3.62	4.11	
	32	Problem Solving	3.45	2.72	3.57	4.06	
	33	Strategic Thinking	3.33	3.00	3.35	3.63	
	34	Achievement Orientation	3.84	3.73	3.69	4.09	
	35	Accountability	3.83	3.51	3.70	4.29	
	36	Entrepreneurship	3.20	2.66	3.19	3.74	
		Technical:	**2.71**	**2.21**	**2.71**	**3.20**	
		Professional:	**3.45**	**2.98**	**3.42**	**3.95**	
		Grand Average:	**2.87**	**2.39**	**2.87**	**3.37**	

Yellow shaded competencies are those competencies considered to be highly important by at least two of the three defined career levels. Green shaded numerical values are those areas in which the workforce reported proficiency levels above the relative career level's calculated Grand Average. Competency values indicate relative proficiency, as reported by respondents: <2 = Awareness; 2 to 3 = Basic to Intermediate; 3 to 4 = Intermediate to Advanced; >4 = Advanced to Expert proficiency. Progression line shows graphic pattern of proficiency across career levels.

The Fourth Estate workforce demonstrates a gap in proficiency in the area of Software Development and Systems Engineering.

For the Fourth Estate, only one technical competency reveals a gap when comparing those competencies viewed as highly important with the measured grand average:

- Software Development and Systems Engineering

Proficiency by career level: Air Force

Air Force IT Acquisition as a whole generally demonstrates basic to intermediate *technical* competence and intermediate to advanced *professional* competence.

For Air Force IT Acquisition as a whole, three technical competencies and six professional competencies (table 12) were determined to be highly important across career levels (highlighted in yellow in table 13). Of the three technical competencies, only Requirements Management indicated a mean rating above 3.0 (intermediate proficiency). However, all professional competencies were reported to have values above 3.0, indicating that the workforce demonstrates *at least* an intermediate proficiency level in tasks requiring professional competence.

Across career levels, proficiency ratings trend higher.

For all competencies, the Air Force workforce reports steady increases in proficiency that correlate with increased career level (table 13).

Table 12. Highly Important competencies for U.S. Air Force proficiency analysis

Technical Competencies	Professional Competencies	
• Deployment and Transition Planning • Requirements Management • Technical Reviews and Audits	• Partnering • Communication • Problem Solving	• Strategic Thinking • Achievement Orientation • Accountability

Table 12 shows competencies considered to be highly important by at least two of the three defined career levels.

Table 13. Mean proficiency for U.S. Air Force analysis

Unit		Competency	Air Force				
			Air Force WF	Entry	Journey	Senior	Air Force Progression
Acquisition Planning	1	IT Legal, Policy, and Regulatory Environment	3.07	2.31	3.08	3.82	
	2	IT Acquisition Strategies and Approaches	2.89	2.04	2.86	3.77	
	3	Capital Planning and Investment Control (CPIC)	2.39	1.67	2.29	3.22	
	4	Business Case Analysis	2.51	1.62	2.50	3.41	
	5	Analysis of Alternatives (AoA)	2.44	2.09	2.23	3.00	
	6	Cost, Schedule and Performance Objectives	2.87	2.00	2.92	3.68	
	7	Capability Planning	2.64	2.15	2.48	3.30	
	8	Enterprise Architecture	2.43	1.73	2.49	3.07	
	9	Data Management	2.77	2.18	2.86	3.27	
	10	Software Development Methodologies and Paradigms	2.47	1.63	2.81	2.97	
	11	Deployment and Transition Planning	2.97	2.10	3.11	3.70	
	12	Continuous Process Improvement	2.79	2.05	2.72	3.61	
	13	Trade Studies	2.46	2.00	2.27	3.11	
	14	Requirements Management	3.15	2.30	3.15	4.01	
	15	IT Project/Program Oversight	2.96	2.10	2.86	3.93	
Program / Project Mgmt	16	Contracting for IT Systems	2.55	1.67	2.49	3.49	
	17	Best Practices	2.80	1.90	2.71	3.80	
	18	Software/Systems Cycle Management	2.77	1.78	2.78	3.75	
	19	Metrics and Measures	2.75	2.05	2.60	3.59	
	20	Risk Management	2.82	2.05	2.76	3.67	
	21	Earned Value Management (EVM)	2.17	1.64	2.13	2.74	
	22	Software Testing and Evaluation	2.63	1.70	2.95	3.24	
	23	Managing IT Investments as Portfolios	2.60	1.88	2.51	3.42	
Technical / System Mgmt	24	SW Quality Assurance (SQA)	2.53	1.88	2.55	3.17	
	25	Technical Reviews and Audits	2.68	1.75	2.74	3.55	
	26	Information Assurance/Cybersecurity	2.74	2.11	2.69	3.43	
	27	Software Development and Systems Engineering	2.75	1.89	2.69	3.65	
	28	Accessibility	2.29	2.00	2.18	2.68	
Professional	29	Partnering	3.04	2.33	2.85	3.92	
	30	Leading Change	2.90	2.09	2.75	3.85	
	31	Communication	3.39	2.67	3.34	4.15	
	32	Problem Solving	3.46	2.67	3.51	4.19	
	33	Strategic Thinking	3.35	2.55	3.31	4.20	
	34	Achievement Orientation	3.68	3.33	3.43	4.26	
	35	Accountability	3.79	3.44	3.58	4.34	
	36	Entrepreneurship	3.29	2.79	2.93	4.14	
		Technical:	**2.68**	**1.94**	**2.66**	**3.43**	
		Professional:	**3.36**	**2.73**	**3.21**	**4.13**	
		Grand Average:	**2.83**	**2.11**	**2.78**	**3.59**	

Yellow shaded competencies are those competencies considered to be highly important by at least two of the three defined career levels. Green shaded numerical values are those areas in which the workforce reported proficiency levels above the relative career level's calculated Grand Average. Competency values indicate relative proficiency, as reported by respondents: <2 = Awareness; 2 to 3 = Basic to Intermediate; 3 to 4 = Intermediate to Advanced; >4 = Advanced to Expert proficiency. Progression line shows graphic pattern of proficiency across career levels.

We summarize the mean proficiency results of the high-importance competencies as rated by Air Force respondents:

- Entry – Mean proficiency ratings are between 2.0 (basic) and 3.0 (intermediate) for two of three high-importance technical competencies and between 2.0 (basic) and 3.0 (intermediate) for four of six professional competencies.
- Journeyman – Mean proficiency ratings are between 3.0 (intermediate) and 4.0 (advanced) for two of three high-importance technical competencies and between 3.0 (intermediate) and 4.0 (advanced) for five of six professional competencies.
- Senior – Mean proficiency ratings are between 3.0 (intermediate) and 4.0 (advanced) for two of three high-importance technical competencies and between 4.0 (advanced) and 5.0 (expert) for five of six professional competencies.

The Air Force workforce demonstrates a gap in proficiency in the area of Technical Reviews and Audits.

For the Air Force, only one technical competency reveals a gap when comparing those competencies viewed as highly important with the measured grand average:

- Technical Reviews and Audits

Proficiency by career level: Army

Army IT Acquisition, as a whole, generally demonstrates basic to intermediate *technical* competence and intermediate to advanced *professional* competence.

For Army IT Acquisition as a whole, only one technical competency was determined to be highly important across career levels, whereas seven professional competencies registered as highly important (table 14 and highlighted in yellow in table 15). The one technical competency, Requirements Management, returned a mean proficiency value of 3.0 (intermediate) or above. All seven highly important professional competencies were reported to have values above 3.0, indicating that the workforce demonstrates *at least* an intermediate proficiency level in tasks requiring professional competence.

Across career levels, proficiency ratings trend higher.

For all competencies, the Army workforce reports steady increases in proficiency that correlate with increased career level (table 15).

Table 14. Highly important competencies for U.S. Army proficiency analysis

Technical Competencies	Professional Competencies	
• Requirements Management	• Partnering • Communication • Problem Solving • Strategic Thinking	• Achievement Orientation • Accountability • Entrepreneurship

Table 14 shows competencies considered to be highly important by at least two of the three defined career levels.

We summarize the mean proficiency results of the high-importance competencies as rated by Army respondents:

- Entry – Mean proficiency ratings are between 2.0 (basic) and 3.0 (intermediate) for the one high-importance technical competency and between 2.0 (basic) and 3.0 (intermediate) for six of seven professional competencies.
- Journeyman – Mean proficiency ratings are between 3.0 (intermediate) and 4.0 (advanced) for the one high-importance technical competency and between 3.0 (intermediate) and 4.0 (advanced) for seven of seven professional competencies.
- Senior – Mean proficiency ratings are between 3.0 (intermediate) and 4.0 (advanced) for the one high-importance technical competency and between 3.0 (intermediate) and 4.0 (advanced) for four of seven professional competencies.

The Army does not reveal gaps in proficiency when comparing those competencies viewed as highly important with the measured grand average.

Table 15. Mean proficiency for U.S. Army

Unit		Competency	Army				
			Army WF	Entry	Journey	Senior	Army Progression
Acquisition Planning	1	IT Legal, Policy, and Regulatory Environment	2.76	1.83	2.86	3.59	
	2	IT Acquisition Strategies and Approaches	2.55	1.91	2.53	3.22	
	3	Capital Planning and Investment Control (CPIC)	2.21	1.62	2.25	2.76	
	4	Business Case Analysis	2.40	1.85	2.26	3.08	
	5	Analysis of Alternatives (AoA)	2.31	1.85	2.26	2.81	
	6	Cost, Schedule and Performance Objectives	2.65	2.03	2.58	3.35	
	7	Capability Planning	2.39	1.86	2.38	2.93	
	8	Enterprise Architecture	2.10	1.33	2.18	2.78	
	9	Data Management	2.50	1.88	2.37	3.24	
	10	Software Development Methodologies and Paradigms	2.51	2.02	2.49	3.01	
	11	Deployment and Transition Planning	2.81	2.12	2.81	3.51	
	12	Continuous Process Improvement	2.63	2.00	2.60	3.30	
	13	Trade Studies	2.37	1.64	2.41	3.06	
	14	Requirements Management	3.10	2.44	3.09	3.77	
	15	IT Project/Program Oversight	2.71	2.05	2.68	3.41	
Program / Project Mgmt	16	Contracting for IT Systems	2.33	1.57	2.40	3.02	
	17	Best Practices	2.67	1.98	2.66	3.37	
	18	Software/Systems Cycle Management	2.67	2.12	2.63	3.27	
	19	Metrics and Measures	2.44	1.77	2.43	3.12	
	20	Risk Management	2.65	2.10	2.59	3.26	
	21	Earned Value Management (EVM)	2.08	1.34	2.22	2.68	
	22	Software Testing and Evaluation	2.65	2.23	2.62	3.11	
	23	Managing IT Investments as Portfolios	2.26	1.58	2.36	2.84	
Technical / System Mgmt	24	SW Quality Assurance (SQA)	2.39	1.72	2.50	2.94	
	25	Technical Reviews and Audits	2.71	2.02	2.74	3.37	
	26	Information Assurance/Cybersecurity	2.73	2.16	2.84	3.20	
	27	Software Development and Systems Engineering	2.67	2.15	2.64	3.22	
	28	Accessibility	2.20	1.56	2.36	2.68	
Professional	29	Partnering	3.06	2.60	3.02	3.57	
	30	Leading Change	2.84	2.27	2.83	3.44	
	31	Communication	3.32	2.81	3.22	3.93	
	32	Problem Solving	3.32	2.66	3.27	4.03	
	33	Strategic Thinking	3.00	2.23	3.11	3.68	
	34	Achievement Orientation	3.50	2.92	3.53	4.04	
	35	Accountability	3.62	3.07	3.60	4.20	
	36	Entrepreneurship	3.14	2.66	3.03	3.75	
		Technical:	**2.52**	**1.88**	**2.52**	**3.14**	
		Professional:	**3.23**	**2.65**	**3.20**	**3.83**	
		Grand Average:	**2.67**	**2.05**	**2.67**	**3.29**	

Yellow shaded competencies are those competencies considered to be highly important by at least two of the three defined career levels. Green shaded numerical values are those areas in which the workforce reported proficiency levels above the relative career level's calculated Grand Average. Competency values indicate relative proficiency, as reported by respondents: <2 = Awareness; 2 to 3 = Basic to Intermediate; 3 to 4 = Intermediate to Advanced; >4 = Advanced to Expert proficiency. Progression line shows graphic pattern of proficiency across career levels.

Proficiency by career level: Navy

Navy IT Acquisition, as a whole, generally demonstrates basic to intermediate *technical* competence and intermediate to advanced *professional* competence.

For Navy IT Acquisition as a whole, three technical competencies and seven professional competencies were determined to be highly important across career levels (table 16 and highlighted in yellow in table 17).

Table 16. Highly Important Competencies for U.S. Navy Proficiency Analysis

Technical Competencies	Professional Competencies	
• IT Legal, Policy, and Regulatory Environment • Requirements Management • Information Assurance/ Cybersecurity	• Partnering • Communication • Problem Solving • Strategic Thinking	• Achievement Orientation • Accountability • Entrepreneurship

Table 16 shows competencies considered to be highly important by at least two of the three defined career levels.

Across career levels, proficiency ratings generally trend higher.

For most competencies, the naval workforce reports steady increases in proficiency that correlate with increased career levels (table 17).

Three of the identified 28 technical competencies showed a decrease in proficiency from Entry to Journeyman (Capability Planning; Metrics and Measures; and Managing IT Investments as Portfolios). To help explain this decrease, we examined these competencies in the context of frequency and criticality. Both dimensions showed decreases in reported value from Entry to Journeyman. Therefore we can hypothesize that, because of decreased criticality, the frequency decreases, ultimately resulting in decreased proficiency surrounding competency behaviors.

Two of the three technical competencies, Requirements Management and IT Legal, Policy, and Regulatory Environment, indicated a mean rating above 3.0 (intermediate proficiency). However, all professional competencies were reported to have values above 3.0, indicating that the workforce demonstrates *at least* an intermediate proficiency level in tasks requiring professional competence.

Table 17. Mean proficiency for U.S. Navy

Unit		Competency	Navy				
			Navy WF	Entry	Journey	Senior	Navy Progression
Acquisition Planning	1	IT Legal, Policy, and Regulatory Environment	3.05	2.49	3.05	3.61	
	2	IT Acquisition Strategies and Approaches	2.83	2.50	2.62	3.35	
	3	Capital Planning and Investment Control (CPIC)	2.33	1.87	2.31	2.81	
	4	Business Case Analysis	2.64	2.21	2.53	3.19	
	5	Analysis of Alternatives (AoA)	2.49	2.20	2.48	2.77	
	6	Cost, Schedule and Performance Objectives	2.94	2.51	2.80	3.51	
	7	Capability Planning	2.67	2.58	2.41	3.01	
	8	Enterprise Architecture	2.46	2.11	2.42	2.86	
	9	Data Management	2.83	2.53	2.78	3.18	
	10	Software Development Methodologies and Paradigms	2.62	2.21	2.59	3.05	
	11	Deployment and Transition Planning	2.97	2.65	2.88	3.37	
	12	Continuous Process Improvement	2.67	1.82	2.90	3.28	
	13	Trade Studies	2.66	2.30	2.59	3.10	
	14	Requirements Management	3.19	2.56	3.22	3.78	
	15	IT Project/Program Oversight	2.95	2.57	2.86	3.44	
Program / Project Mgmt	16	Contracting for IT Systems	2.69	2.32	2.68	3.08	
	17	Best Practices	2.93	2.39	2.95	3.44	
	18	Software/Systems Cycle Management	2.88	2.50	2.85	3.28	
	19	Metrics and Measures	2.93	2.93	2.75	3.12	
	20	Risk Management	2.97	2.67	2.84	3.40	
	21	Earned Value Management (EVM)	2.45	2.35	2.44	2.55	
	22	Software Testing and Evaluation	2.89	2.65	2.84	3.19	
	23	Managing IT Investments as Portfolios	2.84	3.04	2.54	2.94	
Technical / System Mgmt	24	SW Quality Assurance (SQA)	2.52	2.13	2.69	2.76	
	25	Technical Reviews and Audits	2.78	2.26	2.85	3.24	
	26	Information Assurance/Cybersecurity	2.93	2.29	3.12	3.38	
	27	Software Development and Systems Engineering	2.86	2.25	2.91	3.43	
	28	Accessibility	2.51	2.29	2.58	2.67	
Professional	29	Partnering	3.38	3.06	3.37	3.72	
	30	Leading Change	3.06	2.47	3.04	3.67	
	31	Communication	3.44	2.83	3.49	3.99	
	32	Problem Solving	3.54	2.92	3.58	4.13	
	33	Strategic Thinking	3.44	3.24	3.25	3.82	
	34	Achievement Orientation	3.51	2.76	3.76	4.01	
	35	Accountability	3.68	3.13	3.75	4.17	
	36	Entrepreneurship	3.30	2.80	3.33	3.77	
		Technical:	**2.77**	**2.40**	**2.73**	**3.17**	
		Professional:	**3.42**	**2.90**	**3.45**	**3.91**	
		Grand Average:	**2.91**	**2.51**	**2.89**	**3.33**	

Yellow shaded competencies are those competencies considered to be highly important by at least two of the three defined career levels. Green shaded numerical values are those areas in which the workforce reported proficiency levels above the relative career level's calculated Grand Average. Competency values indicate relative proficiency, as reported by respondents: <2 = Awareness; 2 to 3 = Basic to Intermediate; 3 to 4 = Intermediate to Advanced; >4 = Advanced to Expert proficiency. Progression line shows graphic pattern of proficiency across career levels.

We summarize the mean proficiency results of the high-importance competencies as rated by Navy respondents:

- Entry – Mean proficiency ratings are between 2.0 (basic) and 3.0 (intermediate) for three of three high-importance technical competencies and between 2.0 (basic) and 3.0 (intermediate) for four of seven professional competencies.
- Journeyman – Mean proficiency ratings are between 3.0 (intermediate) and 4.0 (advanced) for three of three high-importance technical competencies and between 3.0 (intermediate) and 4.0 (advanced) for seven of seven professional competencies.
- Senior – Mean proficiency ratings are between 3.0 (intermediate) and 4.0 (advanced) for three of three high-importance technical competencies and between 3.0 (intermediate) and 4.0 (advanced) for four of seven professional competencies.

The Navy does not reveal gaps in proficiency when comparing those competencies viewed as highly important with the measured grand average.

Section summary

In summary, we found that proficiency trends tend to move similarly across career levels. When reported proficiency levels decrease, they are accompanied by a decrease in the given competency's associated frequency and criticality ratings.

The IT Acquisition workforce, as a whole, does not reveal gaps in proficiency when comparing highly important competencies (as perceived by the workforce) with measured grand average.

The workforces' Senior career level indicates advanced to expert proficiency in 50 percent of professional competencies. No career level reported greater than advanced technical proficiency.

When we examined the proficiency of the workforce by component, the data seem to show professional competency proficiency ratings of approximately 25 percent higher than those ratings associated with technical competence.

Section 6: Intentions and predictors

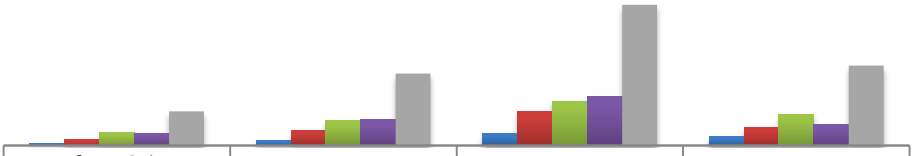
In this section, we present the results of our analysis of respondent-provided intentions data. Our discussion focuses on how respondent intentions relate to continued professional development in the IT Acquisition career field.

Age, retirement, and departure intentions

Age

The most populated age category among IT Acquisition respondents is between 46 and 55 years old. Sixty-seven percent of the respondents are over the age of 46 (figure 13).

Figure 13. Reported age range of IT Acquisition workforce



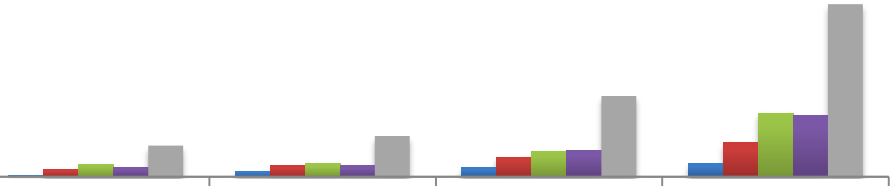
	Less than 35 years old	36 to 45 years old	46 to 55 years old	over 55 years old
4th Estate	1%	2%	4%	3%
Air Force	2%	5%	10%	6%
Army	4%	8%	14%	10%
Navy	4%	8%	15%	6%
Grand Total	10%	22%	43%	24%

n = 1570

Retirement

Although most IT Acquisition respondents indicate that they have more than 10 years until retirement, leadership can expect from respondents' answers that approximately a third of the workforce will retire in less than 10 years and approximately 13 percent will retire in less than 4 years (figure 14).

Figure 14. Reported years until retirement: IT Acquisition workforce



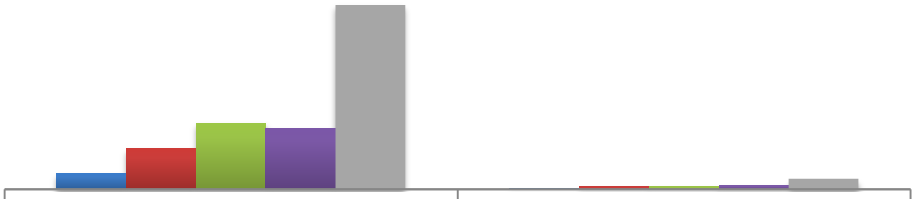
	Unsure of intent	Less than 4 years	In 4 to 10 years	More than 10 years
4th Estate	1%	2%	3%	4%
Air Force	2%	3%	6%	11%
Army	4%	4%	8%	20%
Navy	3%	3%	8%	19%
Grand Total	10%	13%	25%	53%

n = 1570

Departure

First we asked each participant, *Do you intend to leave the IT career field within the next 6 months?* This question was asked to get a better understanding of the short-term stability of the workforce (figure 15). Approximately 5 percent of the respondents indicated that they plan to leave the IT Acquisition career field within the next six months.

Figure 15. Reported Intentions to Leave IT Acquisition Career Field Within Six Months



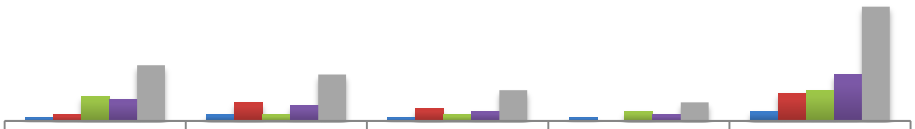
	No	Yes
4th Estate	8%	1%
Air Force	21%	1%
Army	34%	2%
Navy	31%	2%
Grand Total	95%	5%

n = 86

Next, we asked, *why?* 43 percent (figure 16) of those responding indicated a rationale of "other," which in the context of this assessment was generally associated with retirement intentions. Of particular

interest is the relatively large percentage of respondents who answered, "To join another career field" (21 percent).

Figure 16. Reported rationale for career field departure



	To join another career field	To move elsewhere in DOD	To move elsewhere in government	To move to private sector	Other
4th Estate	1%	2%	1%	1%	3%
Air Force	2%	7%	5%	0%	10%
Army	9%	2%	2%	3%	12%
Navy	8%	6%	3%	2%	17%
Grand Total	21%	17%	12%	7%	43%

n = 86

Competency boost

Results presented in tables 18 and 19 are derived from the following intentions statement: *Select the top three competencies in which you plan to boost your proficiency during the next 12-month period.* The results are the top 10 tabulated responses for the IT Acquisition community, ranked according to how frequently they were chosen.

Table 18 aggregates each respondent's top choice of competency targeted for proficiency boost over the next 12 months. Column two reflects percentage of respondents that selected the competency as number one to boost.

Table 19 aggregates each respondent's top three choices of competency targeted for proficiency boost over the next 12 months. Column two represents aggregate number of times competency was selected—each respondent selected three competencies to boost over the next 12 months.

Table 18. Reported top proficiency boost ~12 months: IT Acquisition workforce

Competency	#1 Selection
IT Acquisition Strategies and Approaches	25%
IT Project/Program Oversight	16%
Enterprise Architecture	11%
IT Legal, Policy, and Regulatory Environment	9%
Data Management	8%
Software Development Methodologies and Paradigms	7%
Cost, Schedule and Performance Objectives	6%
Continuous Process Improvement	6%
Requirements Management	5%
Business Case Analysis	4%
Information Assurance/Cybersecurity	3%

Table 19. Most cited competencies for proficiency boost: IT Acquisition workforce

Competency	Times cited
IT Project/Program Oversight	541
Information Assurance/Cybersecurity	383
IT Acquisition Strategies and Approaches	356
Software Development and Systems engineering	226
Enterprise Architecture	213
Data Management	178
Continuous Process Improvement	159
Software Development Methodologies and Paradigms	148
Requirements Management	145
Software Testing and Evaluation	143

n = 1447

IT Acquisition Strategies and Approaches was selected, overwhelmingly, as the top competency to develop over the next 12 months (25 percent of respondents). IT Project/Program Oversight and Enterprise Architecture rounded out the top three selections. When evaluating most cited competencies to boost, across three selections, Oversight and Strategies/Approaches remained in the top three, and Information Assurance/Cybersecurity replaced Enterprise Architecture.

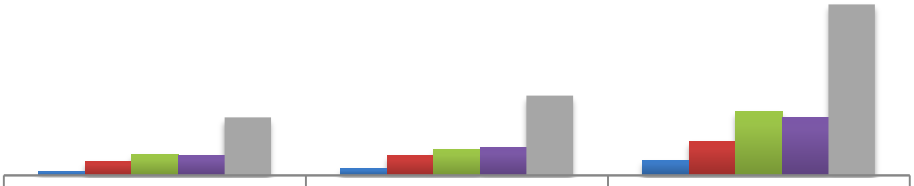
Interestingly, no professional competencies were listed in the top 10, which may signify individuals' acknowledgment of relative importance of technical competence. The highest rated professional competencies were Communication and Leading Change, each with 1.24 percent (as indicated by the number one selected competency).

Among the lowest chosen technical competencies in which respondents intend to boost proficiency, were Trade Studies, Earned Value Management, Managing IT Investments, Metrics and Measures, SW Quality Assurance, and Capital Planning and Investment Control. Of these, only Metrics and Measures is shown to have above average proficiency levels. These competencies all revealed less than a 0.75 percent response rate, which when viewed from a professional development perspective, could be associated with a low importance value (supported with Table 2). While none of the listed competencies were determined to be highly important, Capability Planning was determined to be of medium importance within the Journeyman and Senior career levels of the IT Acquisition workforce.

Mentoring and professional growth intentions

A majority of the workforce is interested in professional growth programs (55 percent) such as mentoring or rotational assignments (figure 17). Almost one- fifth of the workforce is unsure. This could be attributed to a lack of understanding, or a lack of clearly articulated program descriptions, which helps align programs with professional development.

Figure 17. Reported interest in professional growth programs

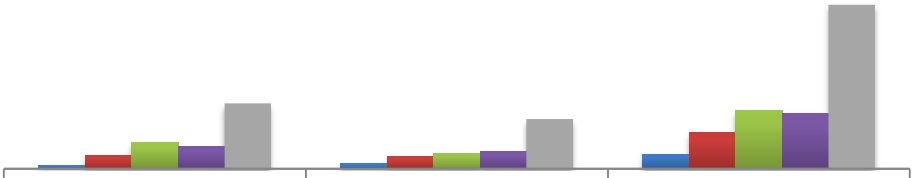


	Unsure	No	Yes
4th Estate	1%	2%	5%
Air Force	5%	6%	11%
Army	7%	8%	21%
Navy	6%	9%	19%
Grand Total	19%	26%	55%

n = 1460

When asked about their willingness to serve as a mentor (figure 18), slightly more than half of the respondents indicated a positive response (59 percent). It is the 41 percent of the workforce that is either unsure or unwilling to serve as a mentor that is of particular interest, from a succession planning perspective. This may be explained by the relatively inexperienced nature of the workforce. While the workforce is generally older, perhaps their experience does not translate well into IT Acquisition, resulting in hesitancy to mentor others.

Figure 18. Reported willingness to serve as mentor



	Unsure	No	Yes
4th Estate	1%	2%	5%
Air Force	5%	4%	13%
Army	9%	6%	21%
Navy	8%	6%	20%
Grand Total	23%	18%	59%

n = 1461

Impact of departing proficiency: IT Acquisition

The intent of this section is to assist leadership in the prediction of future competency gaps within the workforce. This analysis took proficiency as the guiding dimension because it is the individual's unique ability to apply the competency in situations ranging in complexity that is of interest. Usually, those who demonstrate higher rated behaviors are the "go to" members of the workforce.

The following analysis uses mean proficiency values as the predictive value. We identified and highlighted competencies by comparing the mean proficiency value of those indicating intent to depart the workforce against the remaining population. This analysis assumes that any competency deemed highly important by at least one career level is cause for awareness. Highlighting in this manner allows leadership to evaluate the competencies from more of a micro-development perspective.

Those indicating intent to leave the IT Acquisition workforce in less than four years will impact two important competencies the most.

When analyzing proficiency values exiting the system, we find that three competencies show a potential gap of 0.50 or greater in reported proficiency value (table 20).[9] Two of the three competencies are considered to be highly important by at least one career level:

- IT Acquisition Strategies and Approaches
- Leading Change

The components, in general, may experience greater potential gaps in technical competences than in professional competencies.

Table 21 highlights potential gaps of 0.50 or greater in the proficiency value exiting the system over the next four years, for each individual component. When looking across components, we see that the Unit

[9] It is important to note that this analysis compares only the mean values associated with those indicating intent to exit the system within four years and the remaining workforce. Data, at this time, has not been evaluated to determine statistical significance between groups.

of Acquisition Planning generally shows the largest potential gap in proficiency values caused by departures within four years.

Table 20. Proficiency exiting the IT Acquisition sxystem within four years

Unit		Competency	IT WF		
			< 4yrs to Retirement	> 4yrs to Retirements	Difference
Acquisition Planning	1	IT Legal, Policy, and Regulatory Environment	3.39	2.94	-0.45
	2	IT Acquisition Strategies and Approaches	3.26	2.75	-0.51
	3	Capital Planning and Investment Control (CPIC)	2.91	2.34	-0.58
	4	Business Case Analysis	2.80	2.57	-0.22
	5	Analysis of Alternatives (AoA)	2.90	2.70	-0.20
	6	Cost, Schedule and Performance Objectives	3.36	2.89	-0.47
	7	Capability Planning	2.89	2.47	-0.41
	8	Enterprise Architecture	2.89	2.39	-0.49
	9	Data Management	2.90	2.48	-0.42
	10	Software Development Methodologies and Paradigms	3.04	2.67	-0.37
	11	Deployment and Transition Planning	3.22	2.93	-0.28
	12	Continuous Process Improvement	3.22	2.74	-0.48
	13	Trade Studies	3.01	2.55	-0.46
	14	Requirements Management	3.43	3.11	-0.31
	15	IT Project/Program Oversight	3.32	3.02	-0.29
Program / Project Mgmt	16	Contracting for IT Systems	3.02	2.67	-0.35
	17	Best Practices	3.07	2.87	-0.20
	18	Software/Systems Cycle Management	3.06	2.88	-0.18
	19	Metrics and Measures	3.00	2.79	-0.21
	20	Risk Management	3.15	2.89	-0.26
	21	Earned Value Management (EVM)	2.49	2.30	-0.19
	22	Software Testing and Evaluation	3.09	2.75	-0.34
	23	Managing IT Investments as Portfolios	2.69	2.55	-0.14
Technical / System Mgmt	24	SW Quality Assurance (SQA)	3.06	2.70	-0.36
	25	Technical Reviews and Audits	3.27	2.90	-0.37
	26	Information Assurance/Cybersecurity	2.60	2.80	0.20
	27	Software Development and Systems Engineering	3.05	2.83	-0.21
	28	Accessibility	2.29	2.44	0.15
Professional	29	Partnering	3.61	3.23	-0.38
	30	Leading Change	3.52	3.02	-0.50
	31	Communication	3.83	3.48	-0.36
	32	Problem Solving	3.82	3.50	-0.33
	33	Strategic Thinking	3.54	3.37	-0.17
	34	Achievement Orientation	3.83	3.71	-0.12
	35	Accountability	3.87	3.79	-0.08
	36	Entrepreneurship	3.39	3.26	-0.13

Red shading indicates competency areas where the proficiency level of the departing workforce exceeds the remaining workforce by 0.50 or greater. Yellow shading indicates those competencies determined to be highly important by at least one career level.

Table 21. Proficiency Exiting Component Systems Within Four Years

Unit		Competency	4th Estate	Air Force	Army	Navy
			Difference	Difference	Difference	Difference
Acquisition Planning	1	IT Legal, Policy, and Regulatory Environment	-0.28	-0.08	-0.61	-0.53
	2	IT Acquisition Strategies and Approaches	-0.26	-0.48	-0.70	-0.49
	3	Capital Planning and Investment Control (CPIC)	-0.02	-1.09	-0.11	-0.52
	4	Business Case Analysis	0.31	-0.56	-0.22	-0.42
	5	Analysis of Alternatives (AoA)	-0.28	-0.34	-0.49	-0.04
	6	Cost, Schedule and Performance Objectives	-0.54	-0.38	-0.88	-0.40
	7	Capability Planning	0.06	-0.42	-0.53	-0.54
	8	Enterprise Architecture	0.13	-0.81	-0.60	-0.33
	9	Data Management	0.11	-0.68	-0.43	-0.40
	10	Software Development Methodologies and Paradigms	-0.62	-0.43	-0.13	-0.20
	11	Deployment and Transition Planning	-0.23	-0.23	-0.58	-0.15
	12	Continuous Process Improvement	-0.47	-0.37	-0.33	-0.37
	13	Trade Studies	-0.14	-0.55	-0.40	-0.66
	14	Requirements Management	-0.09	-0.34	-0.33	-0.36
	15	IT Project/Program Oversight	0.07	-0.30	-0.64	-0.22
Program / Project Mgmt	16	Contracting for IT Systems	0.15	-0.98	-0.69	-0.23
	17	Best Practices	0.51	-0.72	-0.45	-0.71
	18	Software/Systems Cycle Management	-0.18	-0.41	-0.23	-0.31
	19	Metrics and Measures	0.05	-0.41	-0.17	-0.36
	20	Risk Management	-0.20	-0.37	-0.47	-0.07
	21	Earned Value Management (EVM)	0.10	-0.53	-0.22	-0.25
	22	Software Testing and Evaluation	-0.42	-0.51	0.06	-0.41
	23	Managing IT Investments as Portfolios	0.31	-0.15	-0.59	0.15
Technical / System Mgmt	24	SW Quality Assurance (SQA)	-0.47	-0.10	-0.29	-0.53
	25	Technical Reviews and Audits	-0.33	-0.38	-0.43	-0.18
	26	Information Assurance/Cybersecurity	0.46	0.07	0.10	0.02
	27	Software Development and Systems Engineering	0.09	-0.68	-0.22	-0.12
	28	Accessibility	0.62	-0.28	-0.17	-0.06
Professional	29	Partnering	-0.10	-0.75	-0.24	-0.20
	30	Leading Change	-0.16	-0.87	-0.33	-0.38
	31	Communication	-0.27	-0.41	-0.25	-0.26
	32	Problem Solving	-0.31	-0.25	-0.31	-0.34
	33	Strategic Thinking	-0.01	-0.29	-0.06	0.02
	34	Achievement Orientation	0.07	0.02	-0.18	-0.33
	35	Accountability	0.14	0.09	-0.34	-0.29
	36	Entrepreneurship	0.12	-0.42	-0.04	-0.27

Red Shading indicates competency areas where the proficiency level of the departing workforce exceeds the proficiency of the remaining workforce by 0.50 or greater. See Appendices D through J for a detailed view of component dimensions.

Only two of the highlighted competencies in table 21 were deemed important within the specific component. For Air Force, Partnering is an important competency that will be highly impacted by departures. And for Navy, IT Legal, Policy, and Regulatory Environment is an important competency that will be highly impacted by departures.

Section summary

In summary, we found that the majority of IT Acquisition members are over the age of 46. Approximately 13 percent of the workforce intends to retire within four years, and five percent of the workforce will be departing within six months. Although mostly attributable to retirement, the six-month departure value shows that 38 percent of individuals intend to move to another career field, within DoD.

The competency of IT Acquisition Strategies and Approaches was overwhelmingly selected as the top competency in which to boost proficiency, as reported by the IT Acquisition workforce as a whole. IT Project/Program Oversight, Enterprise Architecture, and Information Assurance/Cybersecurity are also areas in which members are interested in boosting their proficiency levels. Of the least selected competencies, only Metrics and Measures shows above average proficiency.

Within four years, two important IT Acquisition workforce competencies are expected to be affected by member departures—IT Acquisition Strategies and Approaches, and Leading Change.

Section 7: Conclusion and next steps

Our analysis of employee-provided responses to the IT Acquisition competency assessment suggests that the IT Acquisition competency model captures the professional competencies pertinent to the IT Acquisition workforce as a whole, and to the individual components and Fourth Estate agencies separately. From a macro perspective (IT Acquisition workforce as a whole), all professional competencies, except for Leading Change, are considered to be highly important:

- Partnering
- Communication
- Problem Solving
- Strategic Thinking
- Achievement Orientation
- Accountability
- Entrepreneurship

However, when we evaluate technical competencies from a macro perspective (workforce vice career level) and apply the same analysis framework employed in past competency assessments, only two of 28 competencies are determined to be highly important (frequency and criticality measured above 3.0):

- IT Legal, Policy, and Regulatory Environment
- Requirements Management

Although a low number of technical competencies were determined to be highly important across career levels, when asked which competencies they intend to boost over the next 12 months (see tables 18 and 19), respondents indicated, overwhelmingly, a focus on technical competence. This suggests that technical competencies are more important than they were rated.

When we view the workforce as a whole, IT Acquisition respondents report technical proficiency between *basic* and *intermediate*. IT

Acquisition respondents at Entry and Journeyman levels generally report *basic* to *intermediate* proficiency in the technical competencies whereas those at the Senior career level generally report *intermediate* to *advanced* proficiency in technical competencies. The workforce as a whole indicates *intermediate* to *advanced* proficiency in professional competencies.

We focused our proficiency gap analysis on competencies that were determined to be highly important by at least two of the three career levels. Based on this framework, the IT Acquisition workforce does not currently exhibit gaps in its proficiency.

However, four competencies had, in Phase II, been identified by IT Acquisition leadership and SMEs as being associated with superior performance. These competencies are IT Acquisition Strategies and Approaches, Risk Management, Best Practices, and Contracting. Gaps were revealed between how Entry and Journeyman assessment respondents perceived the importance of these competencies and how leadership and SMEs perceived the importance of these competencies.

In addition, our retirement intentions analysis found that, within four years, two important IT Acquisition workforce competencies are expected to be affected by member departures—IT Acquisition Strategies and Approaches, and Leading Change.

IT Acquisition respondents expressed interest in professional growth programs. With a majority of the workforce indicating more than 10 years until retirement, the information found within this report should offer considerable insight into developing a strategic competency-based approach to learning and development.

We recommend that IT Acquisition leadership consider using our analysis results to accomplish the following empirically grounded recommendations. These recommendations have ties to the related literature—these are also indicated.

- Conduct performance audits (Gilbert, 2007) in order to develop proficiency standards. As Gilbert (2007) highlights, in a social context, to effectively measure competence a standard must be identified. Roberts (2003) emphasizes the call for standards in order to support a valid and reliable appraisal system. Standards may then be mapped to performance labels for

clarity. Cizek, Bunch, and Koons (2004) provide a broad overview of the standard setting process.

- Develop gap-closure strategies for high-importance competencies that may have lower proficiency ratings and for those important competencies shown to be exiting the system within four years – the two important competencies expected to be most affected by retirement in the next four years are IT Acquisition Strategies and Approaches and Leading Change.

- Consider developing mentoring programs that emphasize those competencies shown to be highly important in the mentees' current and subsequent career level. As Murray (2006) puts forth, facilitated mentoring can increase productivity, provide a cost-effective manner in which to develop skills, aid in recruitment efforts, enhance the organization's image, and help to achieve strategic goals.

- Design and develop professional growth programs that align with career level and the importance value of competencies. For example, data show that Leading Change is a highly important professional competency within the Senior career level across all components, but not within lower career levels. This recommendation is supported with Spencer and Spencer's (1993) position that "training and development plans must correspond to what employees want for themselves" (p. 287). Effectively designing curriculum, according to Dubois (1993), helps to ensure that organizations do not over-train or under-train the workforce. Finally, providing a roadmap to help the workforce expand their vision of potential competence requirements, according to Zwell (2000), will help to increase self-expectations within the workforce.

- Develop materials that educate the workforce to the benefits of competency development through professional growth programs. Lucia and Lepsinger (1999) emphasize gaining support from those with formal authority as well as those without. The purpose of the competency program must be made clear.

- Place a strong emphasis on the development of professional competencies. Responses to the assessment indicate that professional competencies captured in the IT Acquisition model are universally important to the entire workforce. The

high-importance competencies may need to be boosted as the workforce ages and leadership experience is lost to retirement. Abraham et al. (2001) support this recommendation in their work on managerial competencies and state, "organizations that aspire to be high-performance organizations should be encouraged not only to identify the managerial competencies that are the most critical to successful performance but also to insure that those same competencies are incorporated in the performance appraisal process" (p. 850).

- Finally, use the developed competency model to support alignment of performance planning and appraisal initiatives. According to Spencer and Spencer (1993), the first step in developing a competency-based performance management system is to identify those competencies required for superior performance. If perceptions of importance are not aligned between career field leadership and the workforce, unfair judgments may influence the appraisal process. For example, IT Acquisition leadership and SMEs identified four competencies as being associated with superior performance (IT Acquisition Strategies and Approaches; Risk Management; Best Practices; and Contracting); however, during the assessment, individuals at the Entry and Journeyman career levels indicated these competencies are of a lower perceived importance value.

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Appendix A: IT Acquisition workforce competency model

Unit of Competence	Competency	Element
Acquisition Planning	IT Legal, Policy, and Regulatory Environment	Element 1. Applies and/or assesses laws, policies, regulations, directives and guidance impacting the management and acquisition of DoD IT (e.g., USC Title 40 - Clinger Cohen Act, DoDI 5000.02) to ensure the efficient and effective management of IT systems.
	IT Acquisition Strategies and Approaches	Element 2. Applies and/or develops acquisition strategies that are best suited to IT Acquisitions (e.g., modular contracting, evolutionary acquisition) to obtain the most technical and business effective solution.
		Element 3. Evaluates the applicability of current and emerging IT Acquisition strategies to obtain the most technical and business effective solution.
	Capital Planning and Investment Control (CPIC)	Element 4. Applies and/or assesses capital planning and investment control, methodologies, and approaches (e.g., select, control, evaluate, OMD Exhibit 300) to support achievement of critical business objectives.
	Business Case Analysis	Element 5. Applies and/or assesses the rationale and key parts of building a business case to support achievement of critical business objectives.
	Analysis of Alternatives (AoA)	Element 6. Applies and/or assesses the rationale and use of an AoA to ensure a sound, data-based decision about how to meet critical objectives.
	Cost, Schedule and Performance Objectives	Element 7. Assesses cost and schedule estimates for IT Acquisitions to establish reasonable and practical performance expectations for the government in compliance with government rules and directives.
	Capability Planning	Element 8. Applies and/or creates appropriate documents to satisfy IT capability development (e.g., JCIDS, Business Capability Definition within the Business Capability Lifecycle (BCL)) to ensure a clear understanding of intended objectives from program outset.
	Enterprise Architecture	Element 9. Applies and/or assesses enterprise architectures (EA) and develops EA products (e.g., DODAF) to ensure compliance with DoD EA strategic goals.
	Data Management	Element 10. Applies and/or develops Data Management Strategies (DMS) to ensure compliance with DoD data management strategic goals.
	Software Development Methodologies and Paradigms	Element 11. Applies and/or assesses appropriate software methodologies (i.e., Agile, Scrum, Waterfall, Spiral Model, etc.) to establish reasonable and practical expectations for the government.
	Deployment and Transition Planning	Element 12. Applies and/or assesses fielding and transition plans proposed for an IT system to establish realistic deliverable plans and schedules.
	Continuous Process Improvement	Element 13. Applies the principles of continuous process improvement (e.g., BPR, Lean Six Sigma, CMMI) to ensure the highest quality in acquired products and services.
		Element 14. Applies principles and practices of continuous process improvement to organizational needs and assesses results to improve the internal acquisition business processes of the government.
	Trade Studies	Element 15. Assesses and interprets the results of, and assesses Trade Studies, to support program decision-making at various phases in the life cycle.
	Requirements Management	Element 16. Uses basic requirements development and manage-

		ment techniques to support the acquisition of needed IT systems.
		Element 17. Articulates and effectively manages critical system requirements (e.g., safety, security, privacy) to ensure the effective execution of IT Acquisitions.
		Element 18. Collects and synthesizes user and stakeholder requirements as part of development activities for a given IT project, to ensure that all requirements are identified.
	IT Project/Program Oversight	Element 19. Prepares direction/guidance in support of IT Acquisition reviews at various stages of the program life cycle.
Program/Project Management	Contracting for IT Systems	Element 20. Knowledge of contracting stages and requirements for IT Acquisitions IAW the FARS and DFARS processes to provide a clear and correctly informed acquisition process.
		Element 21. Formulates direction/guidance as Subject Matter Expert (SME) in support of Source Selection Evaluation Board (SSEB) for a given IT system acquisition.
	Best Practices	Element 22. Applies applicable emergent and recommended practices, processes, tools, and strategies relevant to a given IT system acquisition to leverage past experience with current IT investments.
	Software/ Systems Cycle Management	Element 23. Applies and assesses methods, principles, and tools for planning and managing the software Acquisition and development life cycle to establish reasonable and practical expectations for the government.
	Metrics and Measures	Element 24. Applies and interprets different types of metrics/measures (e.g., requirements volatility, key personnel turnover) that can be used to help manage IT system development.
		Element 25. Develops a measurement program tailored to the needs of a given IT Acquisition effort to help manage IT system development.
	Risk Management	Element 26. Applies the basic concepts of the risk management process to allow the government to evaluate and manage acquisitions.
		Element 27. Assesses potential program problems and develops well-formed risk statements and mitigation approaches to address them, to allow the government to evaluate and manage acquisitions.
		Element 28. Manages the implementation of a Risk Mitigation Plan for a given set of risk(s) on an IT project to minimize to potential impacts of these risks.
		Element 29. Establishes viable Risk Management efforts aligned to the needs of a given IT development effort in conformance with the organizational needs and the needs of the procurement.
	Earned Value Management (EVM)	Element 30. Uses the EVM implementation and monitoring processes to support the government in assessing progress in an IT Acquisition.
		Element 31. Analyzes the EVM data and evaluates the outputs of the EVM process to identify problem areas for a given IT development effort.
	Software Testing and Evaluation	Element 32. Develops direction/guidance in support of preparation of test plans and test management plans for IT system development efforts to ensure that the government receives all expected deliverables and that those deliverables are fully functional.
		Element 33. Selects V&V, IV&V and T&E processes applicable to a given IT Acquisition effort to provide maximum test & evaluation results in an efficient manner.
		Element 34. Analyzes and assesses results of software testing to ensure that the government receives all expected deliverables and that those deliverables are fully functional.

	Managing IT Investments as Portfolios	Element 35. Applies the analytical techniques and integrated processes to manage IT capital investments as portfolio linked to specific agency objectives.
Technical/System Management	SW Quality Assurance (SQA)	Element 36. Applies Software Quality Assurance (SQA) standards to ensure the use of effective quality programs in IT Acquisitions.
		Element 37. Evaluates and assesses a developer's Software Quality Assurance (SQA) process to ensure the use of effective quality programs in IT Acquisitions.
	Technical Reviews and Audits	Element 38. Participates in and assesses results of Technical Reviews, Audits, and Program Implementation Reviews (PIRs) used over the development life cycle for an IT system to support the ongoing management of IT Acquisitions.
	Information Assurance/Cybersecurity	Element 39. Develops and applies IA and Cybersecurity requirements for adequacy and effectiveness of security measures, continuity of operations, and protection of systems and system content.
	Software Development and Systems Engineering	Element 40. Applies the basic concepts of Systems Engineering to support the acquisition of fully integrated IT systems.
		Element 41. Manages the interfaces between systems engineering, software development efforts, and project management activities to provide the most effective government-wide process to acquire IT systems.
	Accessibility	Element 42. Applies tools, equipment, technologies, and federal requirements to provide individuals with disabilities access to computer equipment, software, Web sites, etc..
Professional	Partnering	Element 43. Develops networks and builds alliances; collaborates across boundaries to build strategic relationships and achieve common goals.
	Leading Change	Element 44. Demonstrates the ability to bring about strategic change, establish an organizational vision, and implement that vision in a continuously changing environment to meet ever-changing operational goals.
	Communication	Element 45. Communicates technical and complex concepts in a clear and organized manner, both verbally and in writing, to inform and persuade others to adopt and act on specific ideas.
	Problem Solving	Element 46. Makes recommendations, using technical knowledge and experience, weighing the relevance and accuracy of information, accounting for interdependencies, and evaluating alternative solutions.
	Strategic Thinking	Element 47. Formulates and ensures the fulfillment of objectives, priorities, and plans consistent with the long-term business and competitive interests of the organization.
	Achievement Orientation	Element 48. Demonstrates concern for working well or for competing against a standard of excellence.
		Element 49. Improves performance by making specific changes in the organization or own work methods to improve performance.
	Accountability	Element 50. Holds self and others accountable for measureable high-quality, timely, and cost-effective results.
		Element 51. Determines objectives, sets priorities, and delegates work.
		Element 52. Complies with established control systems and rules.
	Entrepreneurship	Element 53. Positions the organization for future success by identifying new opportunities.
		Element 54. Builds the organization by developing or improving products or services.
		Element 55. Takes calculated risks to accomplish organizational objectives.

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Appendix B: Military composition

Figure 19. Military: respondents by component

	Active Duty Military
4th Estate	2%
Air Force	61%
Army	20%
Navy	17%

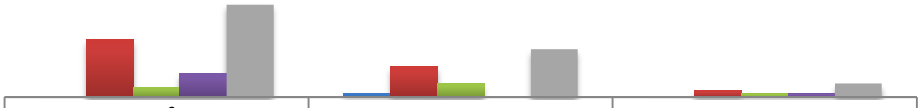
Figure 20. Military: rank composition

	E1 to E5	E6 to E9	O1 to O3	O4 or higher
4th Estate	0%	0%	0%	2%
Air Force	0%	13%	24%	24%
Army	2%	0%	0%	17%
Navy	0%	2%	2%	13%
Grand Total	2%	15%	26%	57%

Figure 21. Military: years of active duty service

	Less than 5 years	5 to 10 years	11 to 15 years	16 to 20 years	21 to 25 years	More than 25 years
4th Estate	0%	0%	2%	0%	0%	0%
Air Force	9%	7%	15%	15%	13%	2%
Army	2%	0%	2%	9%	4%	2%
Navy	0%	0%	4%	9%	4%	0%
Grand Total	11%	7%	24%	33%	22%	4%

Figure 22. Military: intent to continue in federal service



	Unsure of Intent	Yes	No
4th Estate	0%	2%	0%
Air Force	38%	20%	4%
Army	7%	9%	2%
Navy	16%	0%	2%
Grand Total	60%	31%	9%

Figure 23. Military: level of certification

	Not Achieved	One	Two	Three
4th Estate	0%	0%	2%	0%
Air Force	24%	27%	4%	7%
Army	0%	7%	4%	9%
Navy	2%	7%	7%	0%
Grand Total	27%	40%	18%	16%

Appendix C: Fourth Estate frequency, proficiency, and criticality

Unit		Competency	Frequency				Proficiency				Criticality			
			4th Estate				4th Estate				4th Estate			
			4th WF	Entry	Journey	Senior	4th WF	Entry	Journey	Senior	4th WF	Entry	Journey	Senior
Acquisition Planning	1	IT Legal, Policy, and Regulatory Environment	2.98	2.68	2.81	3.44	2.74	1.91	2.87	3.44	2.84	2.55	2.73	3.24
	2	IT Acquisition Strategies and Approaches	2.44	1.93	2.35	3.05	2.54	1.75	2.57	3.29	2.54	2.45	2.28	2.89
	3	Capital Planning and Investment Control (CPIC)	2.08	1.65	2.14	2.46	2.23	1.62	2.16	2.91	2.36	2.59	1.97	2.52
	4	Business Case Analysis	2.30	2.09	1.98	2.84	2.43	1.91	2.23	3.14	2.30	2.26	1.92	2.73
	5	Analysis of Alternatives (AoA)	2.50	2.26	2.29	2.94	2.62	2.72	2.35	2.80	2.26	1.74	2.21	2.85
	6	Cost, Schedule and Performance Objectives	1.46	1.25	1.22	1.91	2.80	2.17	2.80	3.44	2.97	2.61	3.06	3.22
	7	Capability Planning	3.90	3.12	4.89	3.70	2.25	1.67	2.22	2.85	2.05	1.67	2.11	2.37
	8	Enterprise Architecture	1.98	2.00	1.75	2.20	2.43	2.30	2.21	2.77	2.36	2.47	2.19	2.41
	9	Data Management	2.41	2.72	2.32	2.18	2.63	2.26	2.44	3.17	2.62	2.72	2.35	2.80
	10	Software Development Methodologies and Paradigms	2.85	2.58	3.16	2.80	2.87	2.53	3.05	3.05	2.70	2.26	2.91	2.92
	11	Deployment and Transition Planning	2.79	1.99	3.04	3.35	2.91	2.21	2.97	3.54	2.85	2.15	2.94	3.46
	12	Continuous Process Improvement	2.90	2.36	3.05	3.28	2.84	2.06	2.91	3.56	2.96	2.76	2.88	3.25
	13	Trade Studies	2.02	1.00	2.44	2.60	2.69	2.56	2.56	2.96	2.36	2.00	2.53	2.56
	14	Requirements Management	3.08	2.43	3.29	3.51	2.97	2.22	3.03	3.65	3.18	2.71	3.17	3.66
	15	IT Project/Program Oversight	2.89	2.67	2.74	3.25	3.08	2.67	2.94	3.62	3.02	2.83	2.95	3.29
Program / Project Mgmt	16	Contracting for IT Systems	2.72	2.47	2.77	2.91	2.83	2.55	2.62	3.32	3.04	2.93	2.96	3.23
	17	Best Practices	2.45	2.00	2.38	2.97	2.84	2.47	2.57	3.50	2.62	2.26	2.46	3.13
	18	Software/Systems Cycle Management	2.79	2.34	3.07	2.97	2.83	2.10	2.88	3.51	3.03	2.95	3.04	3.09
	19	Metrics and Measures	2.85	2.36	3.29	2.88	2.87	2.25	3.06	3.30	2.87	2.37	3.10	3.15
	20	Risk Management	2.99	2.53	3.28	3.15	2.88	2.07	2.98	3.59	3.23	3.15	3.14	3.41
	21	Earned Value Management (EVM)	2.35	1.79	2.96	2.29	2.41	2.00	2.47	2.76	2.75	2.74	2.95	2.55
	22	Software Testing and Evaluation	2.70	2.33	3.05	2.73	2.82	2.27	3.03	3.15	3.14	3.14	3.23	3.04
	23	Managing IT Investments as Portfolios	2.29	1.74	2.65	2.47	2.39	1.74	2.53	2.90	2.62	2.26	2.88	2.72
Technical / System Mgmt	24	SW Quality Assurance (SQA)	3.05	2.67	3.96	2.51	3.01	2.51	3.46	3.06	3.20	3.00	3.73	2.87
	25	Technical Reviews and Audits	3.14	2.52	3.79	3.13	3.15	2.43	3.45	3.57	3.39	3.33	3.51	3.33
	26	Information Assurance/Cybersecurity	2.50	1.99	2.69	2.82	2.57	2.22	2.43	3.04	3.24	3.38	3.16	3.17
	27	Software Development and Systems Engineering	3.11	3.03	3.28	3.02	2.80	2.21	2.86	3.34	3.35	3.50	3.39	3.17
	28	Accessibility	1.93	1.92	1.78	2.09	2.43	2.62	2.18	2.49	2.59	3.30	2.24	2.24
Professional	29	Partnering	3.11	2.78	2.84	3.73	3.30	2.68	3.27	3.96	3.18	3.11	2.90	3.52
	30	Leading Change	2.93	2.74	2.77	3.29	3.09	2.61	2.98	3.68	3.11	3.04	2.95	3.34
	31	Communication	3.66	3.69	3.45	3.84	3.55	2.93	3.62	4.11	3.54	3.43	3.37	3.81
	32	Problem Solving	3.28	2.84	3.31	3.69	3.45	2.72	3.57	4.06	3.42	3.08	3.40	3.79
	33	Strategic Thinking	3.14	2.85	3.20	3.38	3.33	3.00	3.35	3.63	3.35	3.23	3.36	3.45
	34	Achievement Orientation	3.76	3.89	3.54	3.85	3.84	3.73	3.69	4.09	3.61	3.60	3.49	3.72
	35	Accountability	3.87	3.65	3.79	4.18	3.83	3.51	3.70	4.29	3.81	3.65	3.65	4.13
	36	Entrepreneurship	2.98	2.67	2.93	3.35	3.20	2.66	3.19	3.74	3.21	3.15	3.13	3.35
		Technical:	**2.62**	**2.23**	**2.80**	**2.84**	**2.71**	**2.21**	**2.71**	**3.20**	**2.80**	**2.65**	**2.78**	**2.97**
		Professional:	**3.34**	**3.14**	**3.23**	**3.66**	**3.45**	**2.98**	**3.42**	**3.95**	**3.40**	**3.29**	**3.28**	**3.64**
		Grand Average:	**2.78**	**2.43**	**2.90**	**3.02**	**2.87**	**2.39**	**2.87**	**3.37**	**2.93**	**2.79**	**2.90**	**3.12**

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Appendix D: Fourth Estate exiting competencies

Unit		Competency	4th Estate		
			< 4yrs to Retirement	> 4yrs to Retirements	Difference
Acquisition Planning	1	IT Legal, Policy, and Regulatory Environment	3.08	2.80	-0.28
	2	IT Acquisition Strategies and Approaches	2.89	2.62	-0.26
	3	Capital Planning and Investment Control (CPIC)	2.42	2.40	-0.02
	4	Business Case Analysis	2.25	2.56	0.31
	5	Analysis of Alternatives (AoA)	2.87	2.59	-0.28
	6	Cost, Schedule and Performance Objectives	3.41	2.87	-0.54
	7	Capability Planning	2.21	2.27	0.06
	8	Enterprise Architecture	2.34	2.47	0.13
	9	Data Management	2.52	2.63	0.11
	10	Software Development Methodologies and Paradigms	3.46	2.83	-0.62
	11	Deployment and Transition Planning	3.05	2.83	-0.23
	12	Continuous Process Improvement	3.30	2.83	-0.47
	13	Trade Studies	2.80	2.66	-0.14
	14	Requirements Management	3.07	2.98	-0.09
	15	IT Project/Program Oversight	3.12	3.19	0.07
Program / Project Mgmt	16	Contracting for IT Systems	2.74	2.89	0.15
	17	Best Practices	2.40	2.91	0.51
	18	Software/Systems Cycle Management	3.12	2.94	-0.18
	19	Metrics and Measures	2.83	2.88	0.05
	20	Risk Management	3.17	2.97	-0.20
	21	Earned Value Management (EVM)	2.31	2.41	0.10
	22	Software Testing and Evaluation	3.15	2.72	-0.42
	23	Managing IT Investments as Portfolios	2.15	2.46	0.31
Technical / System Mgmt	24	SW Quality Assurance (SQA)	3.46	2.99	-0.47
	25	Technical Reviews and Audits	3.46	3.13	-0.33
	26	Information Assurance/Cybersecurity	2.19	2.64	0.46
	27	Software Development and Systems Engineering	2.78	2.86	0.09
	28	Accessibility	1.97	2.59	0.62
Professional	29	Partnering	3.47	3.37	-0.10
	30	Leading Change	3.28	3.12	-0.16
	31	Communication	3.88	3.61	-0.27
	32	Problem Solving	3.83	3.52	-0.31
	33	Strategic Thinking	3.34	3.33	-0.01
	34	Achievement Orientation	3.83	3.90	0.07
	35	Accountability	3.79	3.93	0.14
	36	Entrepreneurship	3.15	3.27	0.12

Red shading indicates competency areas where the proficiency level of departing workforce exceeds the proficiency of the remaining workforce by 0.50 or greater. Yellow shading indicates those competencies determined to be highly important by at least one career level.

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Appendix E: Air Force frequency, proficiency, and criticality

Unit		Competency	Frequency				Proficiency				Criticality			
			Air Force				Air Force				Air Force			
			Air Force WF	Entry	Journey	Senior	Air Force WF	Entry	Journey	Senior	Air Force WF	Entry	Journey	Senior
Acquisition Planning	1	IT Legal, Policy, and Regulatory Environment	3.16	2.50	3.16	3.80	3.07	2.31	3.08	3.82	3.01	2.43	2.99	3.60
	2	IT Acquisition Strategies and Approaches	2.88	2.31	2.95	3.39	2.89	2.04	2.86	3.77	2.79	2.04	2.84	3.48
	3	Capital Planning and Investment Control (CPIC)	2.44	2.00	2.32	2.98	2.39	1.67	2.29	3.22	2.50	2.00	2.43	3.07
	4	Business Case Analysis	2.45	1.91	2.44	3.02	2.51	1.62	2.50	3.41	2.54	1.92	2.60	3.11
	5	Analysis of Alternatives (AoA)	2.61	2.27	2.66	2.90	2.44	2.09	2.23	3.00	2.64	2.27	2.57	3.06
	6	Cost, Schedule and Performance Objectives	2.56	2.82	1.99	2.86	2.87	2.00	2.92	3.68	2.93	2.00	3.34	3.46
	7	Capability Planning	3.10	2.00	3.78	3.53	2.64	2.15	2.48	3.30	2.67	2.31	2.62	3.08
	8	Enterprise Architecture	2.31	1.73	2.26	2.93	2.43	1.73	2.49	3.07	2.41	1.91	2.32	2.99
	9	Data Management	2.38	2.27	2.10	2.78	2.77	2.18	2.86	3.27	2.44	2.09	2.23	3.00
	10	Software Development Methodologies and Paradigms	2.27	1.86	2.37	2.60	2.47	1.63	2.81	2.97	2.38	2.00	2.47	2.67
	11	Deployment and Transition Planning	2.93	2.20	3.28	3.32	2.97	2.10	3.11	3.70	2.90	2.00	3.25	3.44
	12	Continuous Process Improvement	2.91	2.45	2.78	3.49	2.79	2.05	2.72	3.61	2.72	2.15	2.63	3.37
	13	Trade Studies	2.37	2.00	2.37	2.76	2.46	2.00	2.27	3.11	2.28	1.67	2.46	2.73
	14	Requirements Management	3.29	2.93	3.21	3.72	3.15	2.30	3.15	4.01	3.26	2.60	3.29	3.89
	15	IT Project/Program Oversight	2.93	2.22	2.88	3.69	2.96	2.10	2.86	3.93	2.90	2.00	2.94	3.75
Program / Project Mgmt	16	Contracting for IT Systems	2.47	1.77	2.67	2.96	2.55	1.67	2.49	3.49	2.75	1.82	3.03	3.42
	17	Best Practices	2.76	2.10	2.82	3.37	2.80	1.90	2.71	3.80	2.67	1.60	2.81	3.61
	18	Software/Systems Cycle Management	2.55	2.00	2.52	3.13	2.77	1.78	2.78	3.75	2.82	2.00	2.96	3.50
	19	Metrics and Measures	2.62	2.17	2.57	3.11	2.75	2.05	2.60	3.59	2.70	2.06	2.69	3.36
	20	Risk Management	2.60	2.13	2.52	3.15	2.82	2.05	2.76	3.67	2.76	1.89	2.84	3.55
	21	Earned Value Management (EVM)	1.76	1.20	1.79	2.29	2.17	1.64	2.13	2.74	2.19	1.67	2.08	2.83
	22	Software Testing and Evaluation	2.36	1.74	2.73	2.61	2.63	1.70	2.95	3.24	2.78	1.83	3.22	3.28
	23	Managing IT Investments as Portfolios	2.44	2.00	2.22	3.10	2.60	1.88	2.51	3.42	2.72	1.86	2.84	3.48
Technical / System Mgmt	24	SW Quality Assurance (SQA)	2.31	1.90	2.37	2.67	2.53	1.88	2.55	3.17	2.56	1.90	2.57	3.22
	25	Technical Reviews and Audits	2.56	1.75	2.80	3.13	2.68	1.75	2.74	3.55	2.67	1.50	3.02	3.50
	26	Information Assurance/Cybersecurity	2.91	2.38	2.93	3.43	2.74	2.11	2.69	3.43	3.21	2.13	3.65	3.86
	27	Software Development and Systems Engineering	2.71	2.00	2.74	3.38	2.75	1.89	2.69	3.65	2.85	1.69	3.20	3.65
	28	Accessibility	2.19	2.50	1.86	2.23	2.29	2.00	2.18	2.68	2.48	2.33	2.25	2.87
Professional	29	Partnering	3.26	2.82	3.03	3.94	3.04	2.33	2.85	3.92	3.22	2.64	3.07	3.94
	30	Leading Change	2.88	2.30	2.71	3.63	2.90	2.09	2.75	3.85	3.15	2.50	3.15	3.81
	31	Communication	3.37	2.75	3.32	4.04	3.39	2.67	3.34	4.15	3.33	2.50	3.53	3.95
	32	Problem Solving	3.49	2.91	3.43	4.12	3.46	2.67	3.51	4.19	3.37	2.73	3.43	3.95
	33	Strategic Thinking	3.35	2.64	3.42	4.00	3.35	2.55	3.31	4.20	3.32	2.55	3.40	4.02
	34	Achievement Orientation	3.87	3.75	3.72	4.13	3.68	3.33	3.43	4.26	3.65	3.54	3.41	4.00
	35	Accountability	3.99	3.81	3.85	4.32	3.79	3.44	3.58	4.34	3.75	3.44	3.62	4.18
	36	Entrepreneurship	3.03	2.64	2.77	3.69	3.29	2.79	2.93	4.14	3.08	2.52	2.94	3.77
		Technical:	**2.60**	**2.11**	**2.61**	**3.08**	**2.68**	**1.94**	**2.66**	**3.43**	**2.70**	**1.99**	**2.79**	**3.32**
		Professional:	**3.41**	**2.95**	**3.28**	**3.99**	**3.36**	**2.73**	**3.21**	**4.13**	**3.36**	**2.80**	**3.32**	**3.95**
		Grand Average:	**2.78**	**2.30**	**2.76**	**3.28**	**2.83**	**2.11**	**2.78**	**3.59**	**2.84**	**2.17**	**2.91**	**3.46**

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Appendix F: Air Force exiting competencies

Unit		Competency	Air Force		
			< 4yrs to Retirement	> 4yrs to Retirements	Difference
Acquisition Planning	1	IT Legal, Policy, and Regulatory Environment	3.16	3.08	-0.08
	2	IT Acquisition Strategies and Approaches	3.35	2.87	-0.48
	3	Capital Planning and Investment Control (CPIC)	3.41	2.32	-1.09
	4	Business Case Analysis	3.04	2.48	-0.56
	5	Analysis of Alternatives (AoA)	3.10	2.76	-0.34
	6	Cost, Schedule and Performance Objectives	3.24	2.87	-0.38
	7	Capability Planning	3.02	2.60	-0.42
	8	Enterprise Architecture	3.18	2.37	-0.81
	9	Data Management	3.07	2.39	-0.68
	10	Software Development Methodologies and Paradigms	2.87	2.44	-0.43
	11	Deployment and Transition Planning	3.23	3.00	-0.23
	12	Continuous Process Improvement	3.15	2.78	-0.37
	13	Trade Studies	2.98	2.43	-0.55
	14	Requirements Management	3.50	3.15	-0.34
	15	IT Project/Program Oversight	3.27	2.97	-0.30
Program / Project Mgmt	16	Contracting for IT Systems	3.48	2.50	-0.98
	17	Best Practices	3.49	2.77	-0.72
	18	Software/Systems Cycle Management	3.19	2.78	-0.41
	19	Metrics and Measures	3.17	2.75	-0.41
	20	Risk Management	3.19	2.82	-0.37
	21	Earned Value Management (EVM)	2.68	2.15	-0.53
	22	Software Testing and Evaluation	3.14	2.63	-0.51
	23	Managing IT Investments as Portfolios	2.72	2.57	-0.15
Technical / System Mgmt	24	SW Quality Assurance (SQA)	2.64	2.55	-0.10
	25	Technical Reviews and Audits	3.06	2.68	-0.38
	26	Information Assurance/Cybersecurity	2.70	2.77	0.07
	27	Software Development and Systems Engineering	3.41	2.73	-0.68
	28	Accessibility	2.52	2.24	-0.28
Professional	29	Partnering	3.74	3.00	-0.75
	30	Leading Change	3.72	2.86	-0.87
	31	Communication	3.80	3.39	-0.41
	32	Problem Solving	3.72	3.47	-0.25
	33	Strategic Thinking	3.65	3.36	-0.29
	34	Achievement Orientation	3.67	3.69	0.02
	35	Accountability	3.72	3.80	0.09
	36	Entrepreneurship	3.70	3.28	-0.42

Red shading indicates competency areas where the proficiency level of departing workforce exceeds the proficiency of the remaining workforce by 0.50 or greater. Yellow shading indicates those competencies determined to be highly important by at least one career level.

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Appendix G: Army frequency, proficiency, and criticality

Unit		Competency	Frequency				Proficiency				Criticality			
			Army				Army				Army			
			Army WF	Entry	Journey	Senior	Army WF	Entry	Journey	Senior	Army WF	Entry	Journey	Senior
Acquisition Planning	1	IT Legal, Policy, and Regulatory Environment	3.06	2.83	2.82	3.52	2.76	1.83	2.86	3.59	2.92	2.63	2.82	3.32
	2	IT Acquisition Strategies and Approaches	2.75	2.67	2.56	3.00	2.55	1.91	2.53	3.22	2.62	2.42	2.51	2.92
	3	Capital Planning and Investment Control (CPIC)	2.26	2.08	2.12	2.58	2.21	1.62	2.25	2.76	2.29	2.19	2.25	2.43
	4	Business Case Analysis	2.55	2.42	2.28	2.94	2.40	1.85	2.26	3.08	2.48	2.34	2.34	2.75
	5	Analysis of Alternatives (AoA)	2.62	2.50	2.32	3.03	2.31	1.85	2.26	2.81	2.59	2.47	2.44	2.87
	6	Cost, Schedule and Performance Objectives	2.32	2.39	2.11	2.47	2.65	2.03	2.58	3.35	2.81	2.60	2.72	3.10
	7	Capability Planning	3.13	2.87	3.05	3.47	2.39	1.86	2.38	2.93	2.45	2.17	2.46	2.71
	8	Enterprise Architecture	2.07	1.60	2.13	2.48	2.10	1.33	2.18	2.78	2.26	1.81	2.38	2.60
	9	Data Management	2.33	2.26	2.21	2.51	2.50	1.88	2.37	3.24	2.31	1.85	2.26	2.81
	10	Software Development Methodologies and Paradigms	2.52	2.68	2.31	2.58	2.51	2.02	2.49	3.01	2.49	2.48	2.42	2.55
	11	Deployment and Transition Planning	2.94	2.79	2.79	3.22	2.81	2.12	2.81	3.51	2.85	2.45	2.91	3.20
	12	Continuous Process Improvement	2.78	2.56	2.66	3.11	2.63	2.00	2.60	3.30	2.80	2.65	2.75	3.02
	13	Trade Studies	2.21	1.95	2.18	2.50	2.37	1.64	2.41	3.06	2.36	2.12	2.35	2.59
	14	Requirements Management	3.26	3.14	3.21	3.44	3.10	2.44	3.09	3.77	3.29	3.11	3.27	3.49
	15	IT Project/Program Oversight	2.70	2.52	2.70	2.88	2.71	2.05	2.68	3.41	2.82	2.40	2.91	3.16
Program / Project Mgmt	16	Contracting for IT Systems	2.43	2.34	2.32	2.62	2.33	1.57	2.40	3.02	2.71	2.65	2.58	2.91
	17	Best Practices	2.47	2.06	2.51	2.84	2.67	1.98	2.66	3.37	2.70	2.42	2.66	3.00
	18	Software/Systems Cycle Management	2.70	2.85	2.43	2.81	2.67	2.12	2.63	3.27	2.87	2.94	2.71	2.97
	19	Metrics and Measures	2.38	2.14	2.29	2.70	2.44	1.77	2.43	3.12	2.55	2.21	2.58	2.85
	20	Risk Management	2.61	2.46	2.48	2.89	2.65	2.10	2.59	3.26	2.86	2.65	2.80	3.13
	21	Earned Value Management (EVM)	1.93	1.64	1.88	2.25	2.08	1.34	2.22	2.68	2.20	1.85	2.15	2.59
	22	Software Testing and Evaluation	2.69	2.71	2.63	2.73	2.65	2.23	2.62	3.11	2.87	2.62	2.92	3.08
	23	Managing IT Investments as Portfolios	2.20	1.86	2.16	2.57	2.26	1.58	2.36	2.84	2.45	1.78	2.69	2.87
Technical / System Mgmt	24	SW Quality Assurance (SQA)	2.31	1.99	2.36	2.58	2.39	1.72	2.50	2.94	2.51	2.05	2.66	2.83
	25	Technical Reviews and Audits	2.55	2.39	2.36	2.90	2.71	2.02	2.74	3.37	2.73	2.42	2.74	3.04
	26	Information Assurance/Cybersecurity	2.93	2.96	2.93	2.91	2.73	2.16	2.84	3.20	3.26	2.99	3.34	3.46
	27	Software Development and Systems Engineering	2.71	2.65	2.59	2.87	2.67	2.15	2.64	3.22	2.91	2.72	2.87	3.16
	28	Accessibility	2.19	2.24	2.10	2.23	2.20	1.56	2.36	2.68	2.59	2.32	2.68	2.76
Professional	29	Partnering	3.27	3.36	2.95	3.52	3.06	2.60	3.02	3.57	3.27	3.29	3.01	3.50
	30	Leading Change	2.78	2.54	2.65	3.14	2.84	2.27	2.83	3.44	3.09	2.88	2.92	3.47
	31	Communication	3.39	3.13	3.35	3.68	3.32	2.81	3.22	3.93	3.39	3.11	3.34	3.72
	32	Problem Solving	3.38	3.06	3.36	3.73	3.32	2.66	3.27	4.03	3.40	3.13	3.32	3.76
	33	Strategic Thinking	3.04	2.59	3.04	3.50	3.00	2.23	3.11	3.68	3.13	2.62	3.18	3.59
	34	Achievement Orientation	3.62	3.25	3.69	3.91	3.50	2.92	3.53	4.04	3.44	2.97	3.50	3.85
	35	Accountability	3.80	3.45	3.83	4.11	3.62	3.07	3.60	4.20	3.62	3.16	3.67	4.02
	36	Entrepreneurship	3.05	3.09	2.78	3.27	3.14	2.66	3.03	3.75	3.28	3.30	3.01	3.53
		Technical:	**2.56**	**2.41**	**2.45**	**2.81**	**2.52**	**1.88**	**2.52**	**3.14**	**2.66**	**2.40**	**2.65**	**2.93**
		Professional:	**3.29**	**3.06**	**3.21**	**3.61**	**3.23**	**2.65**	**3.20**	**3.83**	**3.33**	**3.06**	**3.24**	**3.68**
		Grand Average:	**2.72**	**2.56**	**2.62**	**2.99**	**2.67**	**2.05**	**2.67**	**3.29**	**2.81**	**2.55**	**2.78**	**3.10**

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Appendix H: Army exiting competencies

Unit		Competency	Army		
			< 4yrs to Retirement	> 4yrs to Retirements	Difference
Acquisition Planning	1	IT Legal, Policy, and Regulatory Environment	3.36	2.75	-0.61
	2	IT Acquisition Strategies and Approaches	3.23	2.53	-0.70
	3	Capital Planning and Investment Control (CPIC)	2.34	2.23	-0.11
	4	Business Case Analysis	2.62	2.40	-0.22
	5	Analysis of Alternatives (AoA)	2.99	2.49	-0.49
	6	Cost, Schedule and Performance Objectives	3.50	2.62	-0.88
	7	Capability Planning	2.91	2.38	-0.53
	8	Enterprise Architecture	2.68	2.08	-0.60
	9	Data Management	2.73	2.31	-0.43
	10	Software Development Methodologies and Paradigms	2.66	2.53	-0.13
	11	Deployment and Transition Planning	3.38	2.79	-0.58
	12	Continuous Process Improvement	2.97	2.64	-0.33
	13	Trade Studies	2.77	2.37	-0.40
	14	Requirements Management	3.44	3.10	-0.33
	15	IT Project/Program Oversight	3.34	2.70	-0.64
Program / Project Mgmt	16	Contracting for IT Systems	2.98	2.29	-0.69
	17	Best Practices	3.12	2.67	-0.45
	18	Software/Systems Cycle Management	2.92	2.69	-0.23
	19	Metrics and Measures	2.62	2.45	-0.17
	20	Risk Management	3.11	2.64	-0.47
	21	Earned Value Management (EVM)	2.30	2.08	-0.22
	22	Software Testing and Evaluation	2.61	2.67	0.06
	23	Managing IT Investments as Portfolios	2.84	2.25	-0.59
Technical / System Mgmt	24	SW Quality Assurance (SQA)	2.67	2.39	-0.29
	25	Technical Reviews and Audits	3.13	2.70	-0.43
	26	Information Assurance/Cybersecurity	2.67	2.76	0.10
	27	Software Development and Systems Engineering	2.91	2.69	-0.22
	28	Accessibility	2.39	2.22	-0.17
Professional	29	Partnering	3.30	3.07	-0.24
	30	Leading Change	3.16	2.84	-0.33
	31	Communication	3.58	3.33	-0.25
	32	Problem Solving	3.65	3.33	-0.31
	33	Strategic Thinking	3.10	3.04	-0.06
	34	Achievement Orientation	3.69	3.51	-0.18
	35	Accountability	3.96	3.62	-0.34
	36	Entrepreneurship	3.21	3.17	-0.04

Red shading indicates competency areas where the proficiency level of departing workforce exceeds the proficiency of the remaining workforce by 0.50 or greater. Yellow shading indicates those competencies determined to be highly important by at least one career level.

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Appendix I: Navy frequency, proficiency, and criticality

Unit		Competency	Frequency				Proficiency				Criticality			
				Navy				Navy				Navy		
			Navy WF	Entry	Journey	Senior	Navy WF	Entry	Journey	Senior	Navy WF	Entry	Journey	Senior
Acquisition Planning	1	IT Legal, Policy, and Regulatory Environment	3.32	3.34	3.09	3.53	3.05	2.49	3.05	3.61	3.21	3.25	2.93	3.46
	2	IT Acquisition Strategies and Approaches	2.80	2.64	2.67	3.10	2.83	2.50	2.62	3.35	2.77	2.56	2.65	3.10
	3	Capital Planning and Investment Control (CPIC)	2.18	1.85	2.09	2.60	2.33	1.87	2.31	2.81	2.34	2.06	2.29	2.67
	4	Business Case Analysis	2.66	2.65	2.35	2.97	2.64	2.21	2.53	3.19	2.68	2.56	2.39	3.09
	5	Analysis of Alternatives (AoA)	2.80	3.06	2.48	2.87	2.49	2.20	2.48	2.77	2.88	3.04	2.54	3.06
	6	Cost, Schedule and Performance Objectives	2.68	3.15	2.46	2.41	2.94	2.51	2.80	3.51	3.14	3.27	2.82	3.35
	7	Capability Planning	3.27	3.26	2.95	3.58	2.67	2.58	2.41	3.01	2.83	3.06	2.48	2.95
	8	Enterprise Architecture	2.73	2.99	2.48	2.71	2.46	2.11	2.42	2.86	2.84	3.02	2.55	2.93
	9	Data Management	2.63	2.66	2.60	2.62	2.83	2.53	2.78	3.18	2.49	2.20	2.48	2.77
	10	Software Development Methodologies and Paradigms	2.53	2.34	2.55	2.72	2.62	2.21	2.59	3.05	2.60	2.36	2.62	2.82
	11	Deployment and Transition Planning	2.86	2.81	2.72	3.06	2.97	2.65	2.88	3.37	3.00	2.81	2.89	3.30
	12	Continuous Process Improvement	2.65	2.06	2.78	3.12	2.67	1.82	2.90	3.28	2.66	2.16	2.75	3.05
	13	Trade Studies	2.57	2.80	2.25	2.65	2.66	2.30	2.59	3.10	2.73	2.84	2.48	2.87
	14	Requirements Management	3.25	3.18	3.10	3.47	3.19	2.56	3.22	3.78	3.21	3.00	3.10	3.54
	15	IT Project/Program Oversight	2.95	3.20	2.62	3.02	2.95	2.57	2.86	3.44	3.04	3.17	2.73	3.24
Program / Project Mgmt	16	Contracting for IT Systems	2.60	2.70	2.43	2.67	2.69	2.32	2.68	3.08	2.81	2.78	2.66	3.00
	17	Best Practices	2.77	2.48	2.69	3.14	2.93	2.39	2.95	3.44	2.92	2.73	2.89	3.15
	18	Software/Systems Cycle Management	2.72	2.75	2.55	2.86	2.88	2.50	2.85	3.28	2.92	2.84	2.81	3.10
	19	Metrics and Measures	2.77	3.29	2.26	2.75	2.93	2.93	2.75	3.12	2.86	3.03	2.62	2.92
	20	Risk Management	2.80	2.83	2.61	2.97	2.97	2.67	2.84	3.40	3.01	3.08	2.80	3.15
	21	Earned Value Management (EVM)	2.24	2.63	1.87	2.21	2.45	2.35	2.44	2.55	2.51	2.68	2.31	2.53
	22	Software Testing and Evaluation	2.81	3.18	2.50	2.75	2.89	2.65	2.84	3.19	2.98	2.96	2.83	3.16
	23	Managing IT Investments as Portfolios	2.71	3.22	2.17	2.73	2.84	3.04	2.54	2.94	2.97	3.33	2.65	2.91
Technical / System Mgmt	24	SW Quality Assurance (SQA)	2.49	2.58	2.49	2.39	2.52	2.13	2.69	2.76	2.70	2.54	2.75	2.80
	25	Technical Reviews and Audits	2.69	2.51	2.59	2.98	2.78	2.26	2.85	3.24	2.86	2.60	2.77	3.23
	26	Information Assurance/Cybersecurity	3.06	2.72	3.13	3.33	2.93	2.29	3.12	3.38	3.30	2.82	3.43	3.65
	27	Software Development and Systems Engineering	2.97	2.95	2.84	3.13	2.86	2.25	2.91	3.43	2.97	2.69	2.96	3.25
	28	Accessibility	2.41	2.85	2.10	2.28	2.51	2.29	2.58	2.67	2.77	2.94	2.76	2.60
Professional	29	Partnering	3.49	3.32	3.56	3.58	3.38	3.06	3.37	3.72	3.44	3.35	3.41	3.56
	30	Leading Change	2.92	2.60	2.83	3.34	3.06	2.47	3.04	3.67	3.20	2.89	3.13	3.59
	31	Communication	3.37	2.94	3.39	3.77	3.44	2.83	3.49	3.99	3.32	2.75	3.40	3.81
	32	Problem Solving	3.40	2.94	3.42	3.84	3.54	2.92	3.58	4.13	3.33	2.71	3.45	3.82
	33	Strategic Thinking	3.27	3.25	3.02	3.54	3.44	3.24	3.25	3.82	3.34	3.22	3.19	3.61
	34	Achievement Orientation	3.54	2.99	3.72	3.91	3.51	2.76	3.76	4.01	3.44	2.87	3.67	3.77
	35	Accountability	3.89	3.64	3.93	4.11	3.68	3.13	3.75	4.17	3.69	3.41	3.67	3.99
	36	Entrepreneurship	3.17	3.34	2.88	3.31	3.30	2.80	3.33	3.77	3.35	3.27	3.20	3.58
		Technical:	**2.75**	**2.81**	**2.55**	**2.88**	**2.77**	**2.40**	**2.73**	**3.17**	**2.86**	**2.80**	**2.71**	**3.06**
		Professional:	**3.38**	**3.13**	**3.34**	**3.68**	**3.42**	**2.90**	**3.45**	**3.91**	**3.39**	**3.06**	**3.4**	**3.72**
		Grand Average:	**2.89**	**2.88**	**2.73**	**3.06**	**2.91**	**2.51**	**2.89**	**3.33**	**2.98**	**2.86**	**2.9**	**3.21**

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Appendix J: Navy exiting competencies

Unit		Competency	Navy		
			< 4yrs to Retirement	> 4yrs to Retirements	Difference
Acquisition Planning	1	IT Legal, Policy, and Regulatory Environment	3.56	3.03	-0.53
	2	IT Acquisition Strategies and Approaches	3.30	2.81	-0.49
	3	Capital Planning and Investment Control (CPIC)	2.83	2.31	-0.52
	4	Business Case Analysis	3.06	2.64	-0.42
	5	Analysis of Alternatives (AoA)	2.87	2.83	-0.04
	6	Cost, Schedule and Performance Objectives	3.33	2.93	-0.40
	7	Capability Planning	3.16	2.61	-0.54
	8	Enterprise Architecture	2.77	2.44	-0.33
	9	Data Management	2.88	2.48	-0.40
	10	Software Development Methodologies and Paradigms	2.83	2.63	-0.20
	11	Deployment and Transition Planning	3.13	2.98	-0.15
	12	Continuous Process Improvement	3.01	2.64	-0.37
	13	Trade Studies	3.31	2.64	-0.66
	14	Requirements Management	3.57	3.21	-0.36
	15	IT Project/Program Oversight	3.19	2.97	-0.22
Program / Project Mgmt	16	Contracting for IT Systems	2.91	2.69	-0.23
	17	Best Practices	3.63	2.92	-0.71
	18	Software/Systems Cycle Management	3.18	2.87	-0.31
	19	Metrics and Measures	3.27	2.91	-0.36
	20	Risk Management	3.05	2.98	-0.07
	21	Earned Value Management (EVM)	2.68	2.43	-0.25
	22	Software Testing and Evaluation	3.29	2.88	-0.41
	23	Managing IT Investments as Portfolios	2.72	2.86	0.15
Technical / System Mgmt	24	SW Quality Assurance (SQA)	3.06	2.53	-0.53
	25	Technical Reviews and Audits	3.00	2.81	-0.18
	26	Information Assurance/Cybersecurity	2.93	2.95	0.02
	27	Software Development and Systems Engineering	2.99	2.87	-0.12
	28	Accessibility	2.57	2.51	-0.06
Professional	29	Partnering	3.59	3.39	-0.20
	30	Leading Change	3.42	3.04	-0.38
	31	Communication	3.70	3.44	-0.26
	32	Problem Solving	3.89	3.55	-0.34
	33	Strategic Thinking	3.44	3.46	0.02
	34	Achievement Orientation	3.83	3.50	-0.33
	35	Accountability	3.97	3.68	-0.29
	36	Entrepreneurship	3.56	3.30	-0.27

Red shading indicates competency areas where the proficiency level of departing workforce exceeds the proficiency of the remaining workforce by 0.50 or greater. Yellow shading indicates those competencies determined to be highly important by at least one career level.

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Appendix K: Relative importance of competencies: A comparative map

Unit		Competency	4th Estate Workforce	Air Force Workforce	Army Workforce	Navy Workforce
Acquisition Planning	1	IT Legal, Policy, and Regulatory Environment				
	2	IT Acquisition Strategies and Approaches				
	3	Capital Planning and Investment Control (CPIC)				
	4	Business Case Analysis				
	5	Analysis of Alternatives (AoA)				
	6	Cost, Schedule and Performance Objectives				
	7	Capability Planning				
	8	Enterprise Architecture				
	9	Data Management				
	10	Software Development Methodologies and Paradigms				
	11	Deployment and Transition Planning				
	12	Continuous Process Improvement				
	13	Trade Studies				
	14	Requirements Management				
	15	IT Project/Program Oversight				
Program / Project Mgmt	16	Contracting for IT Systems				
	17	Best Practices				
	18	Software/Systems Cycle Management				
	19	Metrics and Measures				
	20	Risk Management				
	21	Earned Value Management (EVM)				
	22	Software Testing and Evaluation				
	23	Managing IT Investments as Portfolios				
Technical / System Mgmt	24	SW Quality Assurance (SQA)				
	25	Technical Reviews and Audits				
	26	Information Assurance/Cybersecurity				
	27	Software Development and Systems Engineering				
	28	Accessibility				
Professional	29	Partnering				
	30	Leading Change				
	31	Communication				
	32	Problem Solving				
	33	Strategic Thinking				
	34	Achievement Orientation				
	35	Accountability				
	36	Entrepreneurship				

Green shading indicates those competencies rated as highly important (frequency AND criticality >3.0). Yellow shading indicates competencies determined to be of medium importance (frequency OR criticality >3.0). Red shading indicates low importance competencies (frequency AND criticality <3.0).

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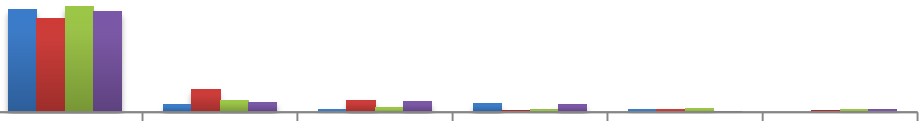
Appendix L: Component demographics

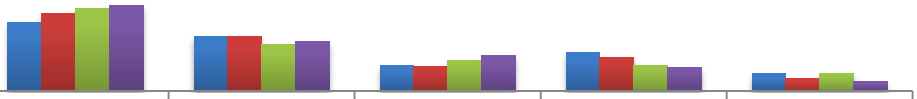
Figure 24. Reported IT Acquisition community association – component specific



	IT	PM	T & E	SPRDE-SE	Contracting	Logistics
4th Estate	76%	6%	2%	6%	2%	0%
Air Force	69%	17%	9%	1%	2%	1%
Army	79%	9%	3%	2%	3%	2%
Navy	75%	8%	8%	6%	0%	2%

n = 1590

Figure 25. Reported years of IT Acquisition experience – component specific



	Less than 5 years	5 to 10 years	11 to 15 years	16 to 25 years	More than 25 years
4th Estate	34%	27%	13%	19%	8%
Air Force	38%	27%	12%	17%	6%
Army	40%	23%	15%	13%	9%
Navy	42%	24%	17%	12%	5%

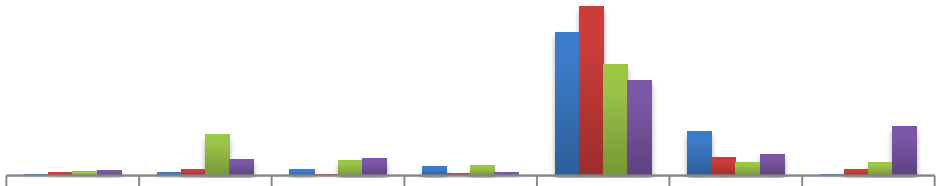
n = 1588

Figure 26. Reported military/civilian experience – component specific

	Active Duty Military	Federal Civilian - No Prior Military Service	Federal Civilian - Prior Military Service
4th Estate	1%	48%	52%
Air Force	8%	31%	61%
Army	2%	39%	59%
Navy	2%	45%	54%

n = 1590

Figure 27. Reported pay bands within IT Acquisition – component specific



	Broadband II	Broadband III	Broadband IV	GS-10 or below	GS-11 to GS-13	GS-14 or higher	Other Pay Plan
4th Estate	1%	1%	3%	4%	69%	21%	1%
Air Force	2%	3%	1%	1%	81%	9%	3%
Army	2%	20%	7%	5%	54%	7%	6%
Navy	2%	8%	8%	2%	46%	10%	24%

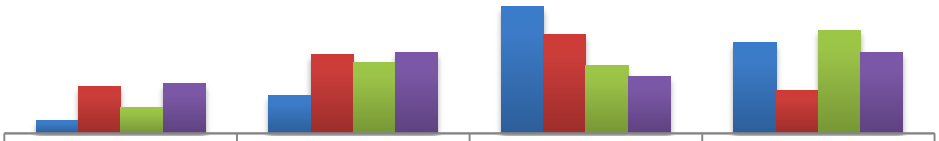
n = 1587

Figure 28. Reported career levels – component specific

	Entry	Journey	Senior
4th Estate	6%	44%	50%
Air Force	9%	45%	47%
Army	8%	44%	48%
Navy	6%	45%	49%

n = 1342

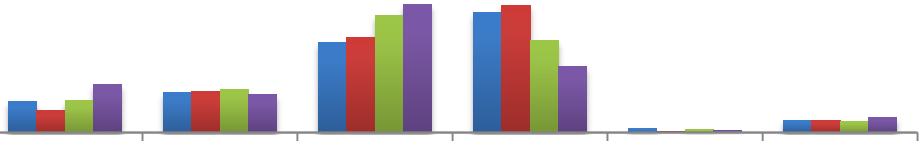
Figure 29. Reported certification levels – component specific



	Not Achieved	One	Two	Three
4th Estate	4.93%	14.08%	47.18%	33.80%
Air Force	17.56%	29.46%	36.83%	16.15%
Army	9.80%	26.38%	25.31%	38.50%
Navy	18.44%	30.23%	21.10%	30.23%

n = 1582

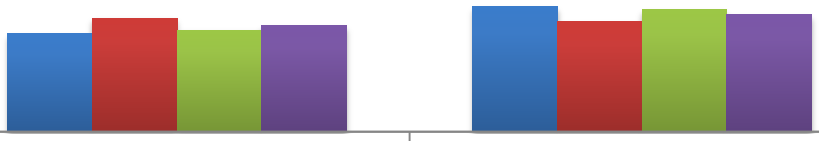
Figure 30. Reported education levels – component specific



	High school diploma	Associate degree	Bachelors degree	Masters degree	Doctoral degree	Other
4th Estate	11%	13%	30%	40%	1%	4%
Air Force	7%	14%	32%	43%	0%	4%
Army	11%	14%	39%	31%	1%	4%
Navy	16%	13%	43%	22%	1%	5%

n = 1587

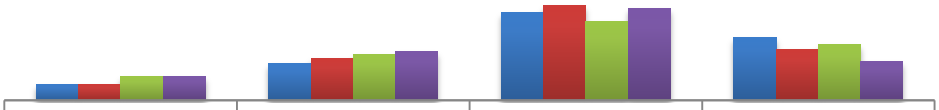
Figure 31. Reported STEM degrees – component specific



	No	Yes
4th Estate	44%	56%
Air Force	51%	49%
Army	45%	55%
Navy	48%	52%

n = 1577

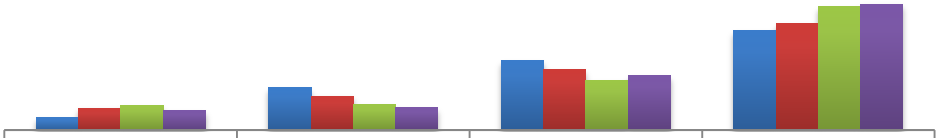
Figure 32. Reported age range – component specific



	Less than 35 years old	36 to 45 years old	46 to 55 years old	over 55 years old
4th Estate	8%	18%	43%	31%
Air Force	8%	21%	46%	25%
Army	12%	22%	39%	27%
Navy	12%	24%	45%	19%

n = 1570

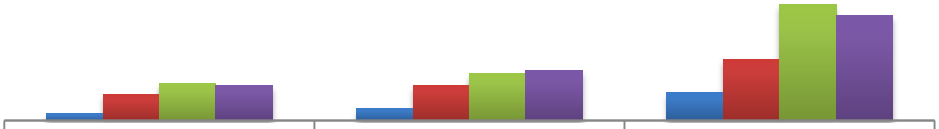
Figure 33. Reported years until retirement – component specific



	Unsure of intent	Less than 4 years	In 4 to 10 years	More than 10 years
4th Estate	6%	19%	31%	44%
Air Force	10%	15%	27%	48%
Army	11%	11%	22%	55%
Navy	9%	10%	25%	56%

n = 1570

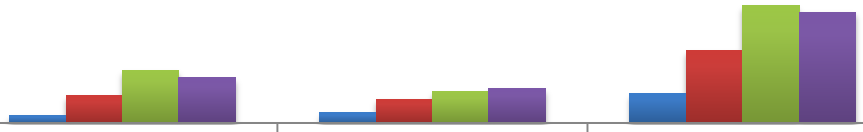
Figure 34. Reported interest in professional growth programs – component specific



	Unsure	No	Yes
4th Estate	18	32	72
Air Force	67	92	160
Army	97	123	303
Navy	92	130	274

n = 1460

Figure 35. Reported willingness to serve as mentor – component specific



	Unsure	No	Yes
4th Estate	19	26	77
Air Force	70	62	188
Army	136	82	305
Navy	117	90	289

n = 1461

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