INITIAL REPORT TO CONGRESS ON FY20 NDAA SECTION 862(B)(1)(A) SOFTWARE DEVELOPMENT AND SOFTWARE ACQUISITION TRAINING AND MANAGEMENT PROGRAMS

Office of the Under Secretary of Defense
for Acquisition and Sustainment

August 2020

A SOFTWARE-CAPABLE DOD WORKFORCE – A STRATEGIC IMPERATIVE

NATIONAL DEFENSE STRATEGY

The 2018 National Defense Strategy (NDS) requires that we modernize key military capabilities to maintain our competitive edge against our adversaries. Software is a critical component of many of the capabilities identified in the NDS, including modernizing the nuclear triad; space and cyberspace warfighting domains; integrating cyber capabilities into the full spectrum of military operations; command, control, communications, computers and intelligence, surveillance, and reconnaissance; missile defense; and advanced autonomous systems. The Department of Defense (DoD) also recognizes the need to transform the acquisition system to improve deployment of software-intensive combat capabilities and supporting systems. DoD relies on its workforce to work effectively with the private sector, through development and acquisition and sustainment, to provide the warfighter hardware and software-reliant operational capabilities efficiently and at the speed of relevance. This requires adopting and adapting modern software development methods and best practices. In 2018, Ellen Lord, the Under Secretary of Defense for Acquisition and Sustainment, stated the degree to which software drives our world demands and requires a move toward a modern tech company model for software delivery: "As we reorganize the way we do business the thread that runs through all of our programs and all that we do is software and I believe that we need to catch up with the private sector and make sure we are using contemporary software development processes." To modernize key military capabilities, the DoD acquisition community must deliberately develop and sustain a software-capable workforce.

DEFENSE INNOVATION BOARD AND DEFENSE SCIENCE BOARD

The Defense Innovation Board (DIB) examined the state of software challenges in DoD's acquisition programs and observed that software is the most frequent and most critical challenge, driving program risk on approximately 60 percent of acquisition programs. The DIB concluded in its May 2019 report that DoD's current approach to software development is broken.[1] Additionally, the DoD Chief Information Officer (CIO) concluded the same in its 2019 DevSecOps guide which states that "legacy software acquisition and development practices in the DoD do not provide the agility to deploy new software 'at the speed of operations.'" The Defense Science Board's 2018 report, *Design and Acquisition of Software for Defense Systems,* emphasizes that "software is a crucial and growing part of weapons systems and the national security mission, and the DoD must address its ability to build and sustain software continuously and indefinitely." The DIB recommended DoD establish specialized training programs to provide insight into modern software development for CIOs, acquisition professionals, and other appropriate DoD personnel. This recommendation is challenging: in current defense acquisition training and management programs, knowledge of and experience in the fundamentals of modern approaches are in short supply, and acquisition professionals like program managers and contracting officers often have limited familiarity with software and Agile development

---

[1] Defense Innovation Board, *Software Is Never Done: Refactoring the Acquisition Code for Competitive Advantage* (Washington, DC: Department of Defense, May 2019), https://media.defense.gov/2019/Apr/30/2002124828/-1/-1/0/SOFTWAREISNEVERDONE_REFACTORINGTHEACQUISITIONCODEFORCOMPETITIVEADVANTAGE_FINAL.SWAP.REPORT.PDF, i.

practices. Existing civilian and military software expertise is scattered throughout the workforce and not systematically identified, tracked, and developed. There are also few career paths available to software acquisition professionals and software developers within the DoD and the Services; therefore, there is minimal room for job growth and little incentive for talented software developers, software engineers, product managers, user experience/user interface (UX/UI) designers, data engineers, etc., to join DoD. As a result, the DoD struggles to attract new talent or take advantage of existing talent, which in turn makes it difficult to identify skill gaps in certain areas and build the new capabilities needed to fill those gaps. These shortfalls add risk to DoD's efforts to deliver quality software capability in a timely manner.

CONGRESSIONAL DIRECTION

Congress has also recognized the need and provided direction to DoD to deliberately develop and sustain a software-capable workforce. Section 862 of the National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2020 (Public Law 116-92) directs the Secretary of Defense, acting through the Under Secretary of Defense for Acquisition and Sustainment and in consultation with the Under Secretary of Defense for Research and Engineering, the Under Secretary of Defense for Personnel and Readiness, and the Chief Information Officer of the Department of Defense, to establish software development and software acquisition training and management programs for all software acquisition professionals, software developers, and other appropriate individuals (as determined by the Secretary of Defense), to earn a certification in software development and software acquisition.

Section 862 requires that the Department's established programs develop and expand use of specialized training programs for chief information officers of the military departments and the Defense Agencies, service acquisition executives, program executive officers, and program managers to include training on and experience in— (i) continuous software development; and (ii) acquisition pathways available to acquire software. Additionally, the Department shall ensure that appropriate program managers— (i) have demonstrated competency in current software processes; (ii) have the skills to lead a workforce that can quickly meet challenges, use software tools that prioritize continuous or frequent upgrades as such tools become available, take up opportunities provided by new innovations, and plan software activities in short iterations to learn from risks of software testing; and (iii) have the experience and training to delegate technical oversight and execution decisions. Section 862 also requires that the programs include continuing education courses, exchanges with private-sector organizations, and experiential training to help individuals maintain skills learned through the programs.

DOD IMPLEMENTS ADAPTIVE ACQUISITION FRAMEWORK – SOFTWARE ACQUISITION PATHWAY

On January 3, 2020, Under Secretary Lord strengthened the foundation for moving to modern software acquisition and development in DoD by issuing the Software Acquisition Pathway Interim Policy and Procedures memo as part of the new Adaptive Acquisition Framework (AAF).[2] The AAF is composed of six acquisition pathways, each tailored for the

---

[2] Information on DoD's Adaptive Acquisition Framework is available at https://aaf.dau.edu/.

unique characteristics and risk profile of the capability being acquired. While software is critical across all AAF pathways, the Software Acquisition Pathway applies specifically to the acquisition, development, operations, and sustainment of DoD software-intensive systems. The key pathway tenets include: simplify the acquisition model to enable continuous integration and delivery of software capability on timelines relevant to the warfighter and end-user; involve end-user early and often in development process to ensure value; establish the software acquisition pathway as the preferred path for acquisition and development of software-intensive systems; establish framework to manage risk and enable successful software acquisition and development; and structure contracts around iterative delivery of capabilities instead of traditional products.

Examples of software intensive systems include software-only systems, such as Command & Control (C2) software or applications; weapon system software, such as Intelligence, Surveillance, and Reconnaissance (ISR) software; embedded mission planning software or embedded Situational Awareness software; and any other custom-developed software running on commercial or modified commercial hardware. Program Managers ensure that software teams use iterative and incremental software development methodologies (such as Agile or Lean), and use modern technologies (e.g., DevSecOps pipelines) to achieve automated testing, continuous integration and continuous delivery of user capabilities, frequent user feedback and engagement at every iteration if possible, robust security and authorization processes, and continuous runtime monitoring of operational software. Additionally, software development teams are required to consider the program's lifecycle objective and use sound software practices to achieve improved software quality (e.g., manage technical debt, actively refactor design and code, and create effective modular open systems approaches to support future capabilities).

DOD IMPLEMENTATION OF TRAINING AND MANAGEMENT PROGRAMS

The USD(A&S) established the DoD Software Workforce Working Group (SWG) in May 2019 to implement the intent of the recommendations of the May 2019 DIB report.[3] The recommendations include guiding the civilian and military workforce in the rapid development and deployment of modern software to the field using DevSecOps practices by working with relevant stakeholders to develop training for acquisition professionals and career paths to recruit and retain acquisition and digital talent. The working group, facilitated by A&S Human Capital Initiatives, includes software and other subject matter experts from the Army, Navy, Air Force, DoD CIO, OUSD (Research & Engineering), OUSD(Personnel and Readiness), Defense Acquisition University (DAU), Air Force Institute of Technology, U.S. Air Force Kessel Run, National Security Innovation Network, Joint Artificial Intelligence Center, and National Security Commission on Artificial Intelligence. With enactment of the FY 2020 NDAA section 862 in December 2019, the SWG assumed responsibility for developing the initial report required by section 862. This report addresses the following section 862 reporting requirements:

A. Status of implementing software development and software acquisition training and management programs established under section 862;
B. Certification requirements, including for competencies in current software processes;
C. Potential career paths in software development and software acquisition within the DoD;

---

[3] DIB, *Software Is Never Done,* S33-S44 (DIB workforce recommendations, or line of effort "C").

D. An independent assessment conducted by the Defense Innovation Board of the progress made on implementing the programs established under section 862; and

E. Any recommendations for changes to existing law to facilitate the implementation of the programs established under section 862.

A. STATUS OF IMPLEMENTING TRAINING AND MANAGEMENT PROGRAMS

Section 862 requires an initial report that describes DoD's efforts to develop and implement software development and software acquisition training and management programs for DoD software acquisition professionals, software developers, and other appropriate individuals. While this report addresses software specifically, SWG members are providing synergy across related digital and software workforce planning efforts. SWG members are involved in related congressional digital-related workforce planning efforts, including those taken to support the FY 2020 NDAA section 230, "Policy on the Talent Management of Digital Expertise and Software Professionals". Section 230 requires DoD to promote and maintain digital expertise and software development as core competencies in DoD civilian and military workforces by recruiting and retaining individuals with an aptitude in digital expertise and software development. Section 230 also promotes the creation of civilian and military career tracks related to digital expertise, to include the development of training, education, talent management, incentives, and promotion policies. Additionally, SWG members are supporting efforts related to the FY 2020 NDAA sections 255 ("Department-Wide Software Science and Technology Strategy") and 256 ("Artificial Intelligence Education Strategy").

SWG efforts support implementation planning of the intent of the DIB recommendations and section 862. The SWG conducts ongoing interviews with DoD and Service programs, including software developers, program managers, and hiring managers, and software factories that develop and deploy software, federally funded research and development centers (FFRDCs), academic institutions, and industry.[4] These interviews inform the identification of work roles and competencies, existing software training and specific gaps in this training, and workforce challenges and best practices for recruiting, hiring, and retaining software talent. The SWG collects feedback on career paths and existing training for acquisition professionals and software developers. The SWG has reviewed four acquisition career fields (program management, engineering, information technology, and contracting), the DevSecOps Community of Practice, and other communities. Interviews and assessment of career paths and training, in combination with a DoD-wide call for issues and questions, was the focus of a virtual Software Workforce roundtable held and recorded on January 29, 2020. This roundtable was preceded by a Software Pathway virtual roundtable, "Software is Never Done", on January 21, 2020. Both of these roundtables contributed to creation of continuing relationships and a strengthened network between the SWG, Service programs, and software factories across DoD. The SWG is leveraging the network and communities of practice in and outside DoD, to improve understanding of challenges and approaches to meeting software workforce needs and sharing of best practices.

Through the above efforts, the SWG has developed an initial comprehensive inventory of software acquisition and development education and training, internal and external, which are already available to the DoD workforce. Examples of available training include:

---

[4] In general, a software factory is an organic, Government-led effort to deliver software products to the warfighter.

The Defense Acquisition University (DAU) has made commercial online training licenses available to the acquisition workforce. The private sector training includes training provided by universities and corporations. This training is available free of charge to acquisition organizations. Examples of program offerings include: Agile Development (provided by University of Virginia (UVA) Darden and University of Alberta), Continuous Delivery and DevOps (provided by UVA Darden and University of California Davis), Python programming (University of Michigan, IBM, Rice) and Cloud Computing (Google, Amazon, University of Illinois).

DAU also provides workshops on Agile and DevSecOps, which combine commercial and in-house developed training – an example of existing internal training available. DAU developed and fielded a course "Agile for DoD Acquisition Team Members" which is the basis of a new DAU Agile credential. DAU also teamed with DoD's DevSecOps pioneers to develop and field a "DevSecOps for the DoD" foundations workshop. The workshop provides an overview of how DoD DevSecOps approaches enable the Department's strategy to rapidly deliver secure, reliable software-based capabilities to the Warfighter. This offering features Full-Stack DevSecOps engineers providing a live, hands-on DevSecOps pipeline demonstration showing how automation, modern processes, and tools support continuous delivery of value, and faster feedback.

In addition, DAU supports DoD Information Technology (IT) leaders and the acquisition workforce needs with significant software acquisition management training. The 8,000 acquisition workforce members identified as having IT responsibilities are supported by a joint governance team that maintains workforce enterprise requirements, including certification levels with their own training, continuous learning, and experience requirements. The IT competencies and IT training requirement identified by the governance team include software acquisition management, along with associated training in cloud, cybersecurity, enterprise architecture, defense business systems, among other topics associated with the IT competency set. This training is accessible to the entire DoD acquisition workforce.

The SWG has compiled an education and training inventory of DoD, Service, and commercial (e.g., Amazon, Google, IBM, LinkedIn Learning) offerings. This inventory also includes a list of current DoD and Service exchange programs, commercial experiential training opportunities, relevant communities of practices, and other sources such as books and videos. All of these resources will be considered in the development of training and management programs to make education and training accessible and manageable to the workforce.

B. STATUS OF CERTIFICATION AND COMPETENCY REQUIREMENTS

Section 862 requires a description of the Department's efforts to institute competency and certification requirements for software acquisition professionals and software developers. The SWG work is ongoing and includes defining the workforce, competencies and roles, identifying the workforce, and developing the alternatives for certification and training. The SWG will revise definitions, competencies, and training as needed.

Defining the Workforce

The SWG is developing definitions, identifying software work roles, competencies, and alternatives for standard definitions and competencies, identifying the workforce in those roles, and identifying gaps in current education and training programs. Two roles are specifically recognized in section 862: software acquisition professional and software developer.

To define a software acquisition professional, the SWG must first baseline and understand the roles within of the acquisition workforce and across the execution of acquisition functions. The SWG is conducting analysis through questions such as:

- What is the role of the software acquisition professional?
- What is the role of the software acquisition professional in comparison or relation to the entire acquisition workforce?
- What knowledge, skills, education, experience, and competency does the software acquisition professional require?
- What are the needs of the writ-large acquisition workforce and specific functions/specialties in terms of varying degree of knowledge, skills, education, experience, and competency of modern software development?
- How and where do software developers link through their work and roles into the acquisition workforce?

To define software developers, the SWG is baselining roles and considering questions such as:

- What are the roles for software developers, software engineers, product managers, designers, and other software roles in the workforce?
- How are these roles similar/different and how can the working group use this information to develop a comprehensive definition for these roles?
- How do acquisition professionals tie into the development of software-intensive systems?
- What training is required to ensure their programs succeed?
- How does the private sector categorize software expertise and software competencies?
- Who is performing software functions across DoD components?

Software Competencies

DoD defines "competency" as "an observable, measurable pattern of knowledge, skills, abilities, behaviors, and other characteristics needed to perform work roles or occupational functions successfully."[5] Software competencies include core competencies that apply to all DoD personnel and specific job competencies for software acquisition professionals and developers (defined by the working group), including CIOs, Service Acquisition Executives, Program Executive Officers, and Program Managers. In addition to determining and defining software roles, the SWG has reviewed existing DoD acquisition competencies (e.g.,

---

[5] *Department of Defense Competency Management Implementation Guide* (2015); DoD Instruction 1400.25, Volume 250, "Civilian Strategic Human Capital Planning," June 7, 2016.

competencies for contracting, financial management, and IT acquisition career fields) and industry standard competency categories, such as the Software Engineering Body of Knowledge (an international standard that describes generally accepted knowledge areas about software engineering), and other private and public sector sources to baseline and then assess variance and whether the competencies can fully or partially address DoD needs. The SWG also reviewed a recent RAND National Defense Research Institute (NDRI) study conducted for OUSD(R&E). RAND NDRI investigated how to improve the ability of the Department to more rapidly and reliability deliver complex software dependent capabilities in three areas. For the first area, RAND developed an initial competency model that emphasized an enhanced understanding of modern software practices and technical competencies. RAND also reviewed training and education offerings at DAU and identified potential gaps in current training. Additionally, RAND provided recommendations for tracking and managing a software acquisition workforce.[6]

An initial set of competencies have been identified; however, additional competencies may be identified during the training gap analysis. The competencies will be validated and revised when needed. The working group will then finalize an approach to identify software acquisition professionals and software developers across the DoD and Services to definitively determine work roles, expand education and training programs, and pre-position individuals into the specialty area who may already possess some but not all of the necessary competencies. The task of identifying the competencies is particularly important because all other efforts (i.e., identifying gaps in training, developing career paths) hinge upon the competencies.

Identifying the Workforce

Identifying the software acquisition and software developer workforce is critical to determining gaps, deploying training and certifications, and performing key talent management functions. DoD government professionals executing software acquisition and software development roles and functions are not systematically tracked in DoD. Acquisition professionals are currently identified in personnel data with a discrete data element. However, the subset of that workforce that has software expertise, has a need for software expertise, or is in a position that requires performance of software functions is not separately tracked. The identification of software developers is also challenging because there is currently no separate career track for these professionals and therefore no way to track them. As a result, software developers are hired and identified through multiple hiring authorities and occupational series (e.g., 0854 Computer Engineering, 1550 Computer Science, or 2210 Information Technology). The SWG is leveraging information gathered from programs and software factories and DoD and Service subject matter experts to assess approaches to identifying the workforce. In addition, the working group is leveraging the experience of those working group members who have previously developed methods to identify software expertise, such as in the cyber workforce. The SWG is also exploring a new civilian software family of occupational series through the Office of Personnel Management. Lastly, the SWG is assessing the requirements for new data elements and coding capabilities in DoD's human resources personnel system to

---

[6] Sean Robson et al., "Software Acquisition Workforce Initiative for the Department of Defense: Initial Competency Development and Preparation for Validation" (Washington, DC: RAND Corporation, 2020), https://www.rand.org/pubs/research_reports/RR3145.html.

account for the software workforce within DoD.

Certification

Defining approaches to certification will follow from the completion of ongoing SWG work on defining the workforce and competencies. Near term, the SWG will identify and communicate training that the workforce can already access and take today based on self-initiative or as part of an individual development plan. The SWG approach includes supporting the success of Services' current service initiatives and leveraging current DAU enterprise resources. The SWG approach also includes assessing and appropriately leveraging commercial standards, certifications, credentialing, and other best practices. In parallel, the SWG's intent is to continue efforts to establish a sound competency-based foundation for any resulting certification framework. The SWG will also develop needed metrics and approaches to ensure managers and the software workforce have easy access to workforce certifications and credentials information. This capability includes ensuring synchronizing with current efforts to modernize talent management and talent management systems for the defense acquisition workforce and other related digital workforce initiatives.

The SWG will provide more details on recommended approaches to certification in the December 2020 report.

C. CAREER PATHS

Section 862 requires a description of efforts to establish career paths in software development and software acquisition within the DoD. The SWG assessment and development of recommended career paths will be informed by its current analysis which includes developing definitions, competencies, workforce identification, training, and certification requirements.

The Department understands that software expertise takes many different forms. It will be a major challenge to ensure that the new career paths take into consideration experiential training, demonstrated capabilities, and on-the-job accomplishments, rather than relying on rigid advancement based on formal education standards, certifications, and years-in-service. There is also the added challenge of ensuring that career paths are cross-cutting and available to all members of the acquisition workforce. Competencies, specialist tracks, and training should be delivered to the primary acquisition workforce (e.g., program management and engineering at a minimum); general competency should be available to support interdisciplinary digital literacy, software knowledge, skills, and abilities across the entire acquisition workforce (e.g., test & evaluation and lifecycle logistics workforce).

Interviews conducted by the working group have reiterated the need for career paths for software acquisition professionals and developers, resources such as mentoring programs, and incentives for remaining within the DoD. As addressed above, the working group is also currently exploring the possibility of creating new civilian software occupational series through the Office of Personnel Management. Should such an occupational series be established, it will significantly simplify the process of identifying, tracking, and building software expertise in the DoD civilian workforce, particularly new recruits, but the DoD will still need to develop a method for identifying and tracking current personnel. Together, these efforts will paint a more

accurate portrayal of the current number and expertise of software acquisition professionals within the acquisition workforce and software developers within the DoD at large.

The DoD is currently considering a functional transformation of the acquisition workforce, which would reduce the number of career fields, allowing the acquisition workforce to develop new expertise and competencies in communities of practice centered on key acquisition issues. Software acquisition will be addressed in the context of how the training, certification, and career development recommendations support the new DoD Instruction 5000 series, Adaptive Acquisition Framework, and which roles meet the criteria for acquisition workforce classification.

The SWG will provide more details on recommended career paths in the December 2020 report.

D. DEFENSE INNOVATION BOARD INDEPENDENT ASSESSMENT

Section 862 requires an independent assessment of this report by the DIB. The DIB, a federal advisory committee that provides advice to the Secretary of Defense, provided an initial assessment of this report at their March 5, 2020, public meeting held at Capital Factory in Austin, TX. Per Federal Advisory Committee Act rules, the DIB must deliberate and approve final findings during a public forum. See Attachment 1 for the DIB's assessment.

E. RECOMMENDATIONS FOR CHANGES TO EXISTING LAW

Section 862 requires the inclusion of recommendations the Department may have for changes to existing law to facilitate implementation. The working group will, if appropriate, make these recommendations in the final report.

SUMMARY

The 2018 NDS requires that DoD modernize key military capabilities to maintain our competitive edge against our adversaries. Software is a critical component of many DoD military capabilities. DoD recognizes that it must create and sustain a software-capable workforce that can effectively partner with the private sector, to provide the warfighter hardware and software-reliant operational capabilities efficiently and at the speed of relevance. Through deployment of the DoD AAF, which includes the new Software Acquisition Pathway, today's Service initiatives such as the Air Force Kessel Run, and joint workforce planning by DoD's Software Workforce Working Group, DoD has put in place the foundation to implement near term-small steps and also the long-term enduring organic software capability within DoD's workforce. DoD will provide the section 862(b)(1)(B) final report to Congress in December 2020.

Fiscal Year 2020 National Defense Authorization Act §862(b)(D)
Defense Innovation Board Assessment: Department of Defense Implementation of
Software Development and Software Acquisition Training and Management Programs
5 March 2020

The Defense Innovation Board (DIB), a federal advisory committee that provides advice to the Secretary of Defense, was tasked to conduct an assessment of Department of Defense (DoD) efforts implementing FY20 NDAA §862, targeted at the implementation of software development and acquisition training and management programs. As part of the DoD reporting requirement to Congress, the DIB Science and Technology (S&T) sub-committee reviewed a draft version of the report in February 2020 in order to facilitate deliberations at its public meeting on 5 March 2020, as required by the Federal Advisory Committee Act (FACA) regulations.

The materials provided to the DIB presented a high level summary of the work that the Department is undertaking to implement §862. Given that the Department's report is still in draft form, the DIB's assessment may not fully address the totality of efforts outlined in the final version of the DoD report that will ultimately be delivered to Congress. If necessary, the DIB may update its assessment following completion of the DoD report. The DIB will also conduct an additional assessment on Department implementation of software development and software acquisition training and management programs in December 2020, as required by Congress.

The DIB's initial report on the results of DoD's implementation of §862 recognizes good overall alignment with the recommendations of the 2018 Defense Science Board (DSB) software report and the 2019 DIB Software Acquisition and Practices (SWAP) study. The DIB applauds the establishment of a software workforce working group charged with proposing the creation of new career paths for digital talent by establishing software development as a high-visibility, high-priority career track and increasing the level of understanding of modern software across the acquisition workforce. This is an area of urgent need within DoD, and by forming a working group to recommend changes to DoD leadership, the Department has created a potential mechanism for change, which is a crucial first step.

In the DIB's review of the draft report, it was clear the working group was focused on developing a baseline understanding of the myriad of ongoing activities in the Department, identifying the gaps and pain points that need to be addressed, and establishing a set of definitions for the different sections of the workforce and the types of capabilities that will be required. The actual implementation of the changes directed by Congress are still in a formative stage.

Some specific results that are reported include:

- Compilation of a list of civilian occupational series that might comprise software developers, as a precursor to discussion regarding a new core occupational series (COS); and

- Review of career roadmaps and positions descriptions developed by DoD software programs, the Services, and industry.

The DIB believes these are all good first steps, but obviously represent a small fraction of the progress and effort that will be required to attract, retain and promote digital talent within DoD. In addition, the DIB is cognizant of several education, training and leadership hiring efforts aimed at addressing workforce capabilities in software acquisition. The DIB continues to encourage DoD to work with partners in Congress to seek legislative support for these efforts. This was the approach recommended in the SWAP study and yielded success with the Software Acquisition Pathway.

Most importantly, the DIB encourages the working group to continue their efforts and to identify ways to move toward implementation more quickly. As one approach toward accelerating its efforts, the DIB strongly encourages DoD to take an innovative approach toward transformation as it continues its work on implementation of §862: *start small and iterate quickly*. This is the same axiom that characterizes the best of modern software innovation cycles and is the cornerstone of the DIB's software acquisition study and recommendations. With some creativity it can be implemented here as well. The DIB encourages DoD to implement a quarterly (or faster) "release cycle" in which the working group makes (modest) recommendations for initial changes that can be tried out within a few units of willing "beta testers". If the changes are successful, then they can be expanded to a larger subset of the Department; if not then they can be "rolled back" with relatively little cost. This approach could be used in establishing initial definitions of the workforce, articulating roles and competencies to map the existing workforce, and creating and testing training and certification programs. Each of these areas are identified in the report as current and proposed areas of study, and we hope that by the final report they will be areas in which multiple iterations of implementation have been tested and adopted.