

Executive Summary:

- Develop a new career and promotion pipeline to capture a wide range of unique I+STEM skills and apply them to DoD challenges
- Explore how military personnel would cycle between these innovation-specific positions and assignments in their functional field to avoid the I+STEM career field becoming its own stovepiped area as opposed to infusing innovation throughout the Department

Problem statement

Some of the biggest challenges the Department of Defense faces today include innovation, technology development and adoption, and recruiting and retaining STEM talent. After enjoying multi-domain dominance for the last seven decades, DoD has settled into a complacent culture that accepts and even expects the norms of the last 70 years to remain viable in the future. The abundance of new technology, the pace of technological change, and our adversaries' ability to rapidly integrate and iterate this technology within their armed forces are changing the character of warfare and closing the advantage once enjoyed by the U.S. Failing to adopt industry best practices in innovation and technology development, and continuing to rely on what has been successful in the past, will not deliver the technological advances required to increase the lethality of the Joint Force on tomorrow's battlefield.

To retain multi-domain dominance, operational surprise, and an ability to adapt quickly, the Department must adjust the way it innovates and integrates new capabilities. This will require a focus on cultivating and developing new skillsets and subject matter expertise in innovation, rapid capability development and adoption, data science, and STEM disciplines. But there is no formal process to recruit, train, develop, and sustain a workforce with these skillsets and hone them as a core competency within the Department. While assembling subject matter experts within certain branches is standard practice across the Services, this has not yet occurred for the abovementioned skillsets – significantly hindering the Department's ability to rapidly innovate and close emerging capability gaps.

Proposed Solution

To maintain the technological advantage over our adversaries that has been in place since World War II, the Department must develop and integrate new skillsets into our processes to better mitigate the challenges posed by emerging and surprise technologies. DoD developed Cyber Warfare as a new branch within the Services and established the United States Cyber Command as a unified combatant command to effectively address cyber warfare challenges. This approach was taken to establish cyber as a core competency within the Department and develop the skills and subject matter expertise necessary for the United States to prevail in the Cyber Domain. In fact, the Services have taken this same approach to manage their core competencies over the history of the Department of Defense based on changing doctrine and the changing character of warfare. Nuclear Propulsion, Aviation, Space and Missile Defense, Information Operations, and Special Operations are all examples of how the Department adjusted existing culture and developed and focused the skillsets necessary to address emerging battlefield challenges. The same approach must be taken with regard to the skillsets necessary to innovate and address the winding capability gap associated with rapidly changing technology and the changing character of warfare.

The Innovation+STEM, or I+STEM, Career Field (which would cover innovation, rapid capability development and acquisition, data science, and STEM) will operate in small teams across the Joint Force. They will be assigned within the table of organization and equipment as a staff section to the Joint Staff, Combatant

Commanders, force providers, doctrine developers, and test and evaluation commands. Teams will advise and assist senior commanders in fostering an innovative culture, use of rapid acquisition techniques, identifying capability gaps and recommending and implementing innovative approaches to quickly mitigate them. Teams will rely on industry standard best practices, STEM skillsets, and operational expertise derived from their experiences as well as the facilitated ideas emanating from within the organization to obtain the best results. Duties will include: integration within the Joint Capability Integration Development System (JCIDS); training and mentoring on the latest business practices that foster innovation and experimentation across the Joint Force; software engineering; identifying and integrating new and innovative technologies to meet current and future capability gaps; expeditiously iterating existing capabilities through the use of rapid acquisition practices; application development; and point of use technology and software upgrades.

Members of this career field must be diverse and possess a mixture of the skills and traits necessary to ensure mission accomplishment. Many of skills required will be obtained through formal education programs prior to entering the service such as STEM degrees. Other skills will be developed in service training schools, operational assignments, and during industry broadening assignments such as application development, understanding of industry best practices and available technologies, lean start-up, change management and domain expertise. Finally, other skills are more inherent to individual service member personality traits such as: prudent risk taking; questioning the status quo; connecting typically unconnected insights to deliver disruptive new ideas; networking with diverse people to generate new ideas; low anxiety and a high degree of emotional stability and confidence.

Each team of I+STEM Career Field professionals must contain a balance of those with highly technical skills as well as those with less tangible personality traits and industry experiences.

Additional solution

As a caveat, we recognize that developing an innovation-specific career field risks creating a stovepiped career field that is disconnected from Service-led missions. Military personnel might come to view innovation as a separate field as opposed to something necessary in every position they find themselves in throughout their careers. The following proposal highlights the need for a new branch or branch-type option as a way to call attention to the inefficient way DoD prepares its people to think more intrapreneurially, but it is essential that innovation is integrated in core military duties, not added on top of them like another requirement.

To that end, while our recommendation does not delve into this option in depth, it is worth exploring how DoD would allow certain personnel to cycle between innovation-specific positions and assignments in their functional career field. This would create and enhance an elite and diverse cadre of innovation experts who can optimize innovation across all military disciplines. Alternating innovation development assignments with functional career positions will help achieve this recommendation without building potential stovepipes disconnected from the rest of the Joint Force.

In addition, current career fields can be adjusted and, in the case of the Air Force, for example, Special Experience Identifiers can be established to capture key expertise and support assignments to innovation fusion cells.

Why a New Branch is the Answer – Challenges with the Status Quo

Many of the skillsets required to address the emerging technological challenges exist within the Department today. Our research leads us to believe that people with such

skills could be enticed to join the Department – particularly due to the success of new outreach efforts such as Hack the Pentagon, among others – if a formal career field supporting these skillsets existed. Unfortunately, service members with these skillsets are contained in pockets across the force, often unknown to the Department, within multiple career fields that are subject to existing culture and personnel management policies. Moreover, there is no formal process in place to train and further hone the skillsets of service members and focus their efforts on resolving Departmental challenges. The same cannot be said for Nuclear Propulsion, Aviation, Space and Missile Defense, Information Operations, and Special Operations. These branches, as well as the multitude of other branches within the service, are specifically recruited, trained, and sustained in order to focus on specific Departmental challenges. These branches offer members a career field with a well-established path that includes ample opportunity for advancement within the career field. Traditional service culture and norms reward service member who follow a prescribed path, within their individual branch, and punish those who fall outside that path by failing to advance them because they are considered unqualified.

The Services have invested in discrete visionary programs to innovate and introduce rapid capability development techniques to increase the lethality of the Joint Force and get capabilities into the hands of service members sooner. The Army's Rapid Capability Office (RCO) and Rapid Equipping Force (REF); the Navy's Rapid Prototyping, Experimentation and Demonstration (REPD) initiative; The Air Force's Revolutionary Acquisition Techniques Procedures and Collaboration (RATPAC) program; and the Special Operations Command's SOFTWERX programs are all great examples of a step in the right direction. However, as previously mentioned, they are not a core competency of the Department and there are no formal processes in place to train and consolidate the subject matter expertise necessary to apply these visionary programs at scale. Moreover, service members who remain within these programs for extended periods, risk future viability within their individual branches.

The Navy's Chief of Naval Operations Rapid Innovation Cell (CRIC) provides an excellent example of what the lack of a specified career field portends for these initiatives. This Cell was established to harness the talents of rising junior officers and enlisted service members from multiple branches across the Navy to solve emerging challenges within the Department. The program allowed team members the flexibility, autonomy and support necessary to develop and implement new ideas, many of which were extremely successful. However, after being in existence for a year, members of the team were returned to the fleet to continue broadening and development in the branches they came from for fear that they would be left behind and not competitive for future advancement. The end result was that the subject matter expertise gained by the CRIC team was not solidified across the Navy and many of the team members left the service for other opportunities that would allow them to continue applying their skills. That in part led to the end of the CRIC. For existing service members, policies, and organizational culture require individuals to be assigned to multiple positions within their operational branch or career field to generate the right broadening experiences to remain competitive for promotion to the next higher grade. Individuals who fall outside this pre-determined path are not competitive for advancement and consequently leave the military. As a result, individuals who possess the skillsets required to address the emerging technological challenges gaps are either not available, or only available for short periods of time. Moreover, those who continue to peruse a non-traditional innovation or

technology focused career path are effectively damaging their future career. The end result is that these talented individuals either leave the service of their own volition or are forced out by an up or out promotion system. Regardless of whether individual service members leave the force or return to their individual branches, the result is the same. The Department is unable to fully capitalize and apply the skillsets and talent of these individuals at scale to solve core challenges.

The I+STEM Career Field does not replace the acquisition career field. However, it does supplement and increase the effectiveness of acquisition professionals by acting as a tool for senior commanders to assist them in focusing on agile adaptation, innovative problem solving, capability identification and development, and rapid acquisition approaches. In the past, multi-domain dominance was dependent on superior weapons systems and platforms where the United States has maintained a distinct advantage. This is where acquisition professionals provide the DoD an advantage because of their ability to manage large, fixed acquisition programs effectively. However, the Department must acknowledge that these systems and their requirements are changing and future warfare will be dependent on software. The country that is the most adept at identifying emerging requirements and quickly iterating the software of its major systems will have the advantage. An F-35 is not a plane with a computer on board – it is a computer with wings. Although we will continue to need acquisition professionals to procure new systems, we will also need the skills outlined in this proposal to agilely iterate the software within these systems to meet a rapidly changing threat environment. Acquiring and iterating software is a distinctly different skillset than procuring major defense systems.

Stepping back from solely acquisition, the Air Force, as an example, utilizes programs like Blue Horizons, run out of the Air Force Center for Strategy and Technology, to select talented STEM individuals and position them for future strategic planning, war gaming, and future technology exploration. The Air Force also offers mid-career incentive pay programs to retain talented individuals with STEM and cyber skills. These cases demonstrate where the military is already implementing this recommendation on a smaller scale and deserve further exploration to see how to expand these ongoing efforts.

Separately, the Marines are creating a discrete military occupational specialty (MOS) in cyber. While MOSs are commonplace, this is an example of working within the system to create a new career path, complementing the goals of DIB Recommendation 14, which aims to remove certain individuals from the normal military workforce.

Benefits of a New Career Field – A Practical Vignette

On a recent site visit, the Defense Innovation Board met with a senior Joint Force Commander. During this engagement, the commander indicated that he wanted to lead the Department in innovation and apply the newest technologies to his command to better meet his current mission set. To facilitate this, he engaged his Strategic Initiatives Group to act as his innovation catalyst. This group, no doubt capable and extremely skilled in strategic and operational planning, does not have the expertise as is envisioned for the proposed career field. Instead of being able to immediately engage with the implementation of their commander's vision, this group will need to spend a considerable amount of time navigating bureaucracy and acquiring the knowledge and expertise required to facilitate innovative, agile, and adaptive capability integration. Moreover, as the Initiatives Group Becomes more proficient, members of the group will begin rotating to new assignments being replaced by untrained teammates, with the process repeating itself. The skills and

experiences gained in rapid innovation techniques by the Strategic Initiatives Group will be lost as a useful tool for the force as they return to basic branch functions in future assignments.

As an alternative, with the integration of this recommendation, the commander would have access to a skilled and trained team who would immediately begin implementation of his or her vision. Team members, knowledgeable of emerging technologies and rapid acquisition practices, and skilled at identifying capability gaps would work to quickly align new capabilities to increase the lethality of the Joint Force. As these new capabilities begin to come on line, subordinate commanders would be mentored and coached on the best way to experiment and further develop those capabilities to increase lethality and adjust to changing threats from our adversaries. Members with computer programming and application development skills would begin to quickly iterate existing capabilities based on the changing requirements on the battlefield without the need to engage private industry in lengthy and expensive software system upgrades. When engagement from industry is required, team members would be able to effectively bridge the gap between contractors and service members making upgrades quicker and more effective based on the needs of the Joint Force. Other team members would be working throughout the command providing training and mentorship on the principles of an innovative, adaptive and agile culture. Acting as a filter for the commander, team members would coach, mentor and shape innovative solutions from the bottom of the organization up to ensure that the commander had a chance to evaluate and implement the best ideas from his command.