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To the members of the Defense Innovation Board,

Noting that the upcoming open meeting of the Board intends to discuss "potential application of emerging technologies such as artificial intelligence, autonomy, and man-machine teaming," I would like to offer the following comments. Although I am writing in a personal capacity as an expert in artificial intelligence (AI), the views contained herein are essentially consistent with those expressed in an open letter published on July 28, 2015 and signed by roughly 20,000 scientists and engineers, and with those expressed in a letter written to President Obama on April 4, 2016 and discussed with senior White House staff at a meeting on May 6, 2016. The authors of the letter to President Obama included the majority of senior leaders in the US AI community and 15 members of the National Academies. A similar letter was sent by the UK AI community to Prime Minister Cameron.

My reason for sending these comments is twofold: first, despite the stipulations of DoD Directive 3000.09 requiring "appropriate levels of human judgment over the use of force" and specifically disallowing autonomous selection of human targets even in defensive settings, current and planned DoD research and development and the public comments of some DoD officials suggest that the US is moving towards future deployments of and reliance on lethal autonomous weapons systems (AWS) as a "third offset"; second, various interactions that I and my colleagues around the country have had with DoD officials suggest that there is not a clear understanding at the highest levels of the potential drawbacks of establishing AWS as a primary means of waging war.

Our primary concern is that further movement in this direction is likely to lead to an arms race with negative outcomes for both humanitarian and strategic concerns: in particular, it may lead to a new class of "scalable" weapons of mass destruction – weapons that even small groups could use to attack large populations. Rather than constituting a "third offset" to maintain US military dominance, these developments would instead pose a threat to US and international security.

Legal and humanitarian considerations

UN Special Rapporteur Christof Heyns, Human Rights Watch, the International Committee of the Red Cross, and other experts have expressed concerns about the ability of autonomous weapons to comply with provisions of the laws of armed conflict regarding military necessity, proportionality, and discrimination between combatants and civilians.

Full compliance is probably not feasible at present or in the near future; it requires that machines make subjective and situational judgments that are considerably more difficult than the relatively simple tasks of searching for and engaging potential targets. Even if compliance becomes technically possible, there is of course no guarantee that all parties would use autonomous weapons in legally compliant ways.

Delegating to a machine the decision over the life or death of a human being also raises a fundamental moral question. The Martens Clause of the Geneva Conventions declares that, "The human person remains under the protection of the principles of humanity and the dictates of public conscience." In this regard, Germany has stated that it "will not accept that the decision over life and death is taken solely by an autonomous system" while Japan "has no plan to develop robots with humans out of the loop, which may be capable of committing murder."[1] BAE Systems, the world's second-largest defense contractor, has asserted that it has no intention of developing autonomous weapons, stating that the removal of the human from the loop is "fundamentally wrong."[2] At present, the broader public has little awareness of the state of technology and the near-term possibilities, but this will presumably change if the killing of humans by autonomous robots becomes commonplace. At that point, the dictates of public conscience will be very clear but it may be too late to follow them.

Strategic considerations

The component technologies for autonomous weapons, including automated decision making, computer vision, robotics, control systems, and precision manufacturing, have reached the point where fully autonomous weapons are currently feasible for many aerial and naval missions and may soon be feasible for urban warfare. An arms race in autonomous weaponry will lead inevitably to low-cost, mass-produced devices such as flying micro-robots able to hunt for and eliminate humans in towns and cities, even inside buildings. Such devices will form a new, scalable class of weapons of mass destruction with destabilizing properties similar to those of biological weapons. Their scalability is tied intrinsically to their autonomy: once available in large numbers on the arms market, they can be acquired, managed, and launched in the millions with few personnel and almost no infrastructure. Thus, they tip the balance of power away from legitimate states and towards terrorists, criminal organizations, and other non-state actors.

The considerations of the preceding paragraph apply principally to weapons designed for ground warfare and anti-personnel operations, and are less relevant for naval and aerial combat. It is still the case, however, that to entrust a significant portion of our defense capability in any sphere to autonomous systems is to court instability and risk strategic surprise. Autonomous weapons in conflict with other autonomous weapons must adapt their behavior quickly, or else their predictability leads to defeat. This adaptability is

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[1] Statements by the respective ambassadors to the CCW meeting in Geneva, April 2015.

[2] Statement by Sir Roger Carr, BAE chairman, at the World Economic Forum, January 21, 2016; https://www.youtube.com/watch?v=opZR7vLhXVg.

necessary but makes autonomous weapons intrinsically unpredictable and hence difficult to control. Moreover, the strategic balance between robot-armed countries can change overnight thanks to software updates or cybersecurity penetration, leading to potentially incorrect perceptions of security or strategic superiority. Finally, the possibility of an accidental war – a military "flash crash" involving spiraling and unpredictable high-speed interactions among competing algorithms – cannot be discounted.[3] Thus, while there are many ways in which AI and related technologies can contribute to the maintenance of US strategic superiority – e.g., reconnaissance, surveillance, intelligence analysis, tactical and strategic situation assessment, and campaign planning – the development of fully autonomous weapons does not appear to be one of them.

With regard to the obvious question of whether continued adherence to DoD Directive 3000.09 would place the US at a strategic disadvantage: the proper course of action seems to be to design an international treaty that will enforce a ban on lethal autonomous weapons. Such a treaty would prevent the large-scale manufacturing that would result in wide dissemination of these scalable weapons. Although limiting proliferation of these technologies comes with unique challenges, experience with the Chemical Weapons Convention suggests that, with industry cooperation, the residual threat from the diversion of dual-use technology into "home-made" weapons may remain manageable. Moreover, defensive anti-missile systems and anti-robot countermeasures could and should remain in place.

Yours sincerely,

Stuart Russell
Professor of Computer Science, UC Berkeley

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[3] A recent report from the Center for a New American Security, "Autonomous Weapons and Operational Risk," makes many of the same points.

**INPUT TO PUBLIC MEETING OF THE OCTOBER 2016
DEFENSE INNOVATION BOARD
FROM JEFF EGGERS
SENIOR FELLOW, INTERNATIONAL SECURITY PROGRAM
NEW AMERICA**

To the members of the Defense Innovation Board:

I provide for your consideration observations and recommendations concerning the first two agenda items for your forthcoming October 2016 meeting: (a) promoting innovative practices and culture in the conventional forces; and (b) barriers to innovation and collaboration in the civilian workforce.

I see our greatest defense challenge to be how we think, and our greatest potential threat as a future failure to adapt and be more open to new ways of thinking. Amidst a rapidly shifting and uncertain landscape, we can ill afford to be locked into old patterns of thinking. With budgetary pressures, a shifting global landscape and a relative decline in global influence, we must improve our cognitive adaptability or suffer the consequence of failing to do so. I believe that warfare is no longer a fundamental contest of capability and resource overmatch; rather, I now see it as primarily a race of adaptation.

The concept of adaptability is yet to be defined formally by the Department. A 2010-2011 Defense Science Board defined adaptability as the "ability and willingness to anticipate the need for change, to prepare for that change, and to implement changes in a timely and effective manner in response to the surrounding environment." However defined, the concept of adaptability in defense planning is now en vogue, because it is seen as mitigating the risk posed by an uncertain and increasingly complex operating environment. Successful defense policy hinges on adaptability not just because we face an increasingly complex environment, but increasingly because we are consistently and profoundly unable, despite our best efforts, to accurately predict the future and the threats it will bring.

Greater intellectual adaptability will not only better posture the U.S. against an uncertain future, it will also improve the rigor and fidelity with which we make decisions in defense policy amid a dynamic landscape. We will do better at seeing the world as it is, vice how we wish it were or thought it would be. And we'll be less prone to the logical fallacies that are often woven into human thinking.

Further, adaptability in this context should not be misconstrued as how we buy or acquire technology, but is instead directed at how we think about defense policy and strategy itself. Of course, technology is important, but we tend to over-emphasize and misperceive technology as the crux of innovation. Technology cuts both ways,

and is not always the solution to innovation; rather, innovation as the solution to the problem of technology.

More specifically, I see intellectual adaptability as deriving from three critical aspects of how we think: *intellectual innovation,* or our ability to think creatively; *intellectual integrity,* or having the courage to challenge assumptions; and *intellectual humility*, or our empathy to listen and learn.

Intellectual innovation, integrity and humility derive from an organization's culture, and ultimately, its people. So any reformation to the future of policy-making should start with how we invest in people. The potential in personnel reform is more strategic than retention, healthcare, retirement and compensation, as important as those issues are. Rather, the focus of personnel reform should be the broader spectrum of development to include recruiting, assessments, promotions, and education.

It is my sense that our military's operationally-focused, command-centric culture is working against the development of intellectual adaptability. The model of promotion and personnel management is built around the operational command experience. The more our forces run to the sound of guns and serve in operational units, the more promising their career. By contrast, experiences that expose people to new ways of thinking, such as civilian schools, are still seen as rewards or "good deals."

Moreover, these "broadening" opportunities, where they do occur, are seen as "rests" from the grueling operational pace. Thus the military officer student is incentivized to "take a knee" at school rather than actively invest in their learning and growth. How they do or what they write as students is generally irrelevant to their career promotion. Military colleges have a 100% pass rate, which does not reflect a rigorous process of independent learning. Overall, the operational culture still views broadening as a cost to be minimized vice a long-term investment to be expanded.

We can't rely solely on a generation of combat experience and new technology. The development of our people, and their ideas, is how we'll adapt and outsmart future enemies. Along these lines, I offer two sets of recommendations to promote the strengthening of intellectual adaptability in defense policy and strategy. The first set of recommendations would rebalance priorities at the *individual* level, i.e. within the context of talent development and career planning, mostly in the military context. The second set of recommendations would make changes at the *organizational* level, mostly in the context of defense civilians.

1. **Prioritize People and their Cognitive Development.** The conventional military officer career path is based on the outdated idea that command at every level requires command experience at the prior level. Enhancing adaptability and cognitive performance will require broadening and diversifying this career

path and allowing for differentiation of officer skill sets. Force of the Future cracks the door to make academic and interagency tours mandatory for promotion, but dilution and partial implementation of such proposals is problematic.   The following recommendations would put cognitive development on a par with tactical proficiency, based on the premise that rebalancing combat warfare proficiency with broadening education and training in divergent thinking will improve our future intellectual adaptability.

- **Prioritize Academic Growth**. Academic or research "broadening" tours where military leaders are exposed to new ways of thinking should be as important to promotion as combat experience. Status quo career incentives should be rebalanced to <u>make academic "broadening" tour experiences more common by the O-6 milestone, with a significant expansion of civilian school opportunities</u>.

- **Promote Differentiation.** Outlying officers who do not achieve the "fast-track" operational career because they have greater inclination to non-command academic or policy tours should not be handicapped in their career. Force of the Future expands "technical tracks" for such officers, but this risks perpetuating the stratified, two-tier system of the "command track" and everyone else, which is not healthy. Until there is better equity and balance between the command tracks and other tracks, the non-command tracks will not attract and promote the best people. <u>The concept of a "technical" track should be made commensurate with the "command" track and include near-equal opportunities for the policy-minded strategists.</u>

- **Promote a Meritocracy**. Carrot-based incentives to retain the "best and brightest" are unlikely to succeed. What drives many such officers out is not the pay or benefits, but frustration with a time-in-grade system of promotion. If the rate of advancement could vary based on demonstrated aptitude for responsibility and leadership, with a less rigid system of tickets that needed to be punched, the "best and brightest" would be more amenable to being retained. <u>Such a shift could be enabled by more aggressively expanding and making more flexible the "early promote" quota system and removing the year-group management controls in the mid-grade years</u>.

2. **Enhance Intellectual Adaptability within Defense Policy**

- **Conduct internal, independent policy and strategy assessments**. Policy developers and implementers should not be grading their own homework. While the intelligence agencies will continue to play a role in evaluating the implementation of policy, it is unproductive for the Pentagon to rely on another agency to assess its defense policies. Rather, <u>the Defense Department should have an institutionalized, independent "red team" of experts and outsiders dedicated to and empowered with the task of</u>

rigorously testing policy and strategy assumptions and opening eyes to alternate perspectives. This office should be led by an independent, direct report to the Secretary, comparable to the existing offices for budgetary and programmatic oversight (CAPE) and over-the-horizon analysis (ONA). Objective policy assessment is at least as important as long-term forecasting and budgetary evaluation.

- **Dedicate and separate policy developers and implementers**. The urgency of policy implementation generally dominates policy resources, leaving little bandwidth for dedicated policy development. The two functions should be related, as implementation should inform development, but they should not be one in the same. OSD should consider such a policy model, whereby policy development personnel are dedicated and protected from the distractions of policy implementation issues and day-to-day operational crises.

- **Enhance the development of civilian policy professionals**. OSD should augment the professional development of policy civilians with specialized training to enhance critical thinking in policy development and assessment. The Army's University of Foreign Military and Cultural Studies at Ft. Leavenworth gives an in-depth course of instruction to those who serve on "red teams" and provides a shorter curriculum to all Army officers, which includes important lessons on group think mitigation and fostering cultural empathy. Something similar could also be useful to civilian policy personnel.

DEFENSE INNOVATION BOARD
PUBLIC COMMENTS RECEIVED IN ADVANCE OF 10/5/16 PUBLIC MEETING

The following comments were received by the Board via email.

Comments submitted by a civilian director of an innovation program

The Department of Defense (DoD) is under new pressure to develop cost effective capabilities that keep pace with the rapid rate of change in the modern threat and technology environments. Today, breakthrough technology is being driven in part by entrepreneurs and innovators outside of the national security community, but too often these innovators have no awareness of or connection to the national security challenges facing the country.

In order to fully capitalize on the intellectual capital of the nation, DoD must create new opportunities to collaborate with citizen innovators in the development of solutions to national security problems.

To address this issue, the MD5 National Security Technology Accelerator (MD5) has developed a program called Hacking for Defense (H4D). Executed in partnership with a network of civilian universities, H4D is a for-credit course that connects challenges sponsored by DoD agencies with student-led "solver" teams. Over the course of a semester, student-teams collaborate with agency sponsors and industry mentors to develop, test, and refine technology-based solution concepts leveraging the Lean Launchpad methodology. Outcomes for the course range from helping DoD agencies better understand the impacts of emerging technologies on their missions to building and deploying working prototypes in real-world environments.

Based on the early positive feedback from participating DoD agencies, MD5 is pursuing opportunities to (1) scale the H4D program to more universities, (2) develop additional capacity to work with DoD agencies to source challenges, and (3) expand the H4D curriculum to incorporate policy-related solution development.

MD5 seeks advocacy from the Defense Innovation Board to pilot and scale programs like H4D that accelerate workforce-driven innovation.

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Comments submitted by a U.S. Air Force Colonel

Has the DIB identified a solution to the one of the greatest challenges facing DOD "innovation" surrounding the lack of awareness of similar efforts?

Just within the Defense Intelligence Enterprise (DIE) (NSA, NGA, DIA, NRO, DSS, Services) the level of "innovation" effort is significant ($B) yet the cross-organizations lack awareness of efforts of similar veins is troubling. i.e. Big Data, Data Visualization, Cyber Defense, Data Integrity/Validity... All are investing yet awareness of the investments, and engagements with industry are not transparent.

Many of these areas of effort are similar challenges outside of the intelligence arena... ie Logistics, VA, Health, DHS... all seek solutions that are the same or very similar.

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Comments submitted by the manager of a DoD information sharing platform

The Innovation Board should consider that they need to be aware of what has been happening for common open innovation in milSuite for the last few years and how this can scale the culture in DoD.

Many organizations are ideating and innovating on milSuite via secure crowdsourcing. We encourage the DoD Innovation Board to be aware of and consider what has been happening on milSuite to engage the joint DoD audience with groups and communities such as ARcyber2A, DIUx, eureka - milSuite's open innovation community, Navy RAD (Reducing Administrative Distractions) and many other formal and informal Communities of Practice/Interest such as the Innovaders(c), where it all started on milSuite. The service-wide Army Ideas for Innovation (AI2) open innovation community will have been launched by this board meeting with an aim for executable, and scalable, service-wide quick win innovations. We encourage support of this service wide effort milSuite is a FOUO/NIPR CAC-secure, social business knowledge management collaboration platform. Many organizations from the joint DoD audience are taking advantage of the ideation and innovation management capabilities. milSuite is free to use at any time by any CAC approved personnel in DoD, the US Coast Guard (DHS), government employees with a DoD CAC, and CAC approved contractors.

milSuite has many Groups and Communities of Practice/Interest finding success at formal command levels. As such, milSuite enables cultural change, dissemination of knowledge on innovation and ideation efforts, and exposure for the organizations involved in the domain. milSuite enables positive collaboration, sharing and culture change.

milSuite will continue to help encourage, educate and positively change the culture of DoD personnel who desire to be engaged in crowdsourced innovation in many areas of the Joint DoD total force and interagency population. milSuite can, and does, both directly and indirectly assist innovation engagement efforts across DoD in the following Innovation Board issues noted below.

The collective milSuite team encourages a deeper involvement with the Innovation Board to enhance its efforts in outreach, engagement with the DoD military, civilian, and contractor crowds for:

(a) promoting innovative practices and culture in the conventional forces;

(b) barriers to innovation and collaboration in the civilian workforce;

(c) barriers to information sharing and the processing, exploitation, dissemination, and interoperability of data;

(d) enabling workforce-driven innovation using crowdsourcing methodologies and techniques

milSuite is open to be used by anyone in DoD-GOV with a DOD approved CAC and they are in control of their presence. The milSuite team recommends that the Defense Innovation Board have its own presence on milSuite so that its members and agents of change can engage with the crowd securely, and be involved in and aware of what is happening within it, much of which we believe the Board may be unaware of today. milSuite stands ready to assist and is proud of what we have done to date for DoD

innovation return on investment. We look forward to even more of we can do to enhance this creative potential and necessary capability.

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Comments submitted by a Senior Technical Advisor for Intelligence

I would like to make the DIB aware of the Intelligence Investment Fund (I2F) and the work USDI does to seed high TRL technologies being applied to innovative concepts, usually with low Concept Maturity Level, to solve problems in the 2-5 year time frame.

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Comments submitted by a U.S. Marine Corps Captain

This comment focuses on the emergent attempts by the services to create rapid capabilities development processes, and the imperative for a coordinated approach that is both resourced with appropriate investments, people, and authorities - and enabled by the Office of the Secretary of Defense (OSD).

Our capabilities development ecosystem has been designed around a set of rules that served us well when facing adversaries that were large in scale, relatively predictable, and for which we had an understanding of their intent. Further, the technology we employed to counter those adversaries was similarly large, expensive, and subject to near-linear improvement.

Following these rules, our strict hierarchical culture and functionality-driven oversight models were able to cleanly delineate the complex science of war into something that could be managed through explicit policies and processes - namely the Joint Capabilities Integration Development System (JCIDS), the Joint Requirements Oversight Council (JROC), and the Defense Federal Acquisition Regulation (DFAR). This combination of culture, models, and policies dictates increased control and oversight as program expense similarly increases through the designation of Acquisition Categories (ACAT) I through IV.

However, today's global landscape is enveloped in rapid and unpredictable volatility. This volatility is manifested through visible and measurable change in the areas of globalization, urbanization, commercial technological advancement, and the evolution of non-traditional threat actors. The implications for the Department of Defense are simple: the rules have changed. And so must our perspective on developing particular warfighting capabilities.

These new rules require DoD to be resilient to change - that is, they should serve to strengthen our military when complexity is at its highest. Rather than continuing to force our fiscal year, linear-by-design, processes to attempt to 'control' exponential change, we must create rapid capability development (RCD) pathways that capitalize on the bough wave of one of the last bastions of American strategic advantage: our ingenuity.

Each service-specific RCD pathway must be unique to the service due to the unique service design of capability development. Already all four services have established or are working towards establishing a

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RCD pathway - though largely independent of unified OSD coordination or resources, such as investments, authorities, or key personnel staffing. These RCD pathways must capitalize on the vastly under-utilized and under-transitioned research & development (R&D) occurring across the DoD R&D Enterprise.

In an attempt to start this important dialogue at the DoD's highest levels, it is my opinion (and not necessarily that of my service) that these pathways should have five distinct characteristics. These recommendations have been refined over the course of a year as part of my participation in establishing an RCD pathway on behalf of Headquarters Marine Corps Installations & Logistics (HQMC, I&L). Many of them are influenced heavily through proven successes and failures in DoD and modern corporate innovation practices.

One, the RCD pathway will be focused on deep and valuable partnerships with three key communities that are too often under-represented in capabilities development: non-traditional industry, academia, and warfighters. First, OSD has begun to improve non-traditional industry engagement through efforts such as Small Business Innovation Research (SBIR) and Defense Innovation Unit-Experimental (DIUx). These efforts are necessary, but not sufficient to ensure success. Service-sponsored RCD pathways are also necessary for efforts such as DIUx and SBIR to take root into the services. Second, the leading research universities - and their graduates - are increasingly turning to industry for transition. RCD pathways should reach into these universities and provide improved service-sponsored opportunities for valuable research and graduate employment. Finally, crowdsourcing efforts continue to show incredible value for the services, and they are a critical tool for engaging warfighter input and solving meaningful problems at both the tactical and strategic levels. RCD pathways must employ crowdsourcing, experimentation, lean, agile, and design-thinking tools that place the warfighter as close to the solutions development process as possible. Crowdsourcing efforts should also look increasingly to expand into the civilian sector.

Two, the RCD pathway will retain consolidated authorities for R&D, requirements, contracting, acquisition, and fielding. A proper RCD pathway must have constant cognizance and control over the holistic development of specific capabilities, something which is currently fractured into several competing organizations, each with their own distinct authorities over their portion of the process. Key to this is the ability to find relevant DoD and industry R&D, conduct iterative experimentation, rapidly develop follow-on requirements, and then work to standup or influence existing acquisition programs - particularly as a result of the increase of the NDAA-16 service acquisition authorities. However, the RCD pathways must ensure that they do not become the acquisition program manager themselves. Rather, much like a corporate accelerator or incubator, they are there to test and scale new acquisition programs. Underpinning this is the ability to flexibly and quickly develop new contracts within weeks, not months or years as conventional contracting allows for. This is most likely to occur through the establishment of an RCD Other Transaction Authority (OTA).

Three, the RCD pathway will have complete authority for assigning or hiring their key personnel. Modern business has realized the value of an entrepreneurial mindset in both the small business world and the "intrapreneur" reciprocal in the corporate environment. However, DoD continues to ignore the outsized value that these intrapreneurs can offer, and there are no mechanisms to deliberately

incentivize, develop, or protect them. This results in misalignment of talent across the organization, but even within some of the current RCD pathways. This misalignment occurs in two ways, both intrapreneurs that are not placed in an RCD offices and RCD offices that are staffed without critical intrapreneurial talent. Therefore, the RCD pathway must be able to identify, assign, and hire a small staff of key intrapreneurial talent, something that is oftentimes near-impossible in today's current personnel management processes.

Four, the RCD pathway will be responsible directly to the service chief. The service chief is the only member of the service who has the authority to guide the strategic development of their branch of service, and they retain immense respect up and down the chain of command. This positional authority must be extended to the RCD pathways, as the members within the RCD will be routinely advocating for an uncomfortable level of change across the service. This change will inevitably be resisted, so all parties must be fully aware of the importance that the RCD pathway holds to the service chief. This proximity also critically ensures that the RCD pathway is aligned to strategic warfighting vision and concepts that are often only the purview of a handful of key service leaders.

Five, the RCD pathway must have predictable, though not always significant, funding. Due to the immense size of the services and the DoD R&D Enterprise, funding is often available if sufficient partnerships are able to be formed. Said another way by Navy AT1 Richard Walsh, "We are not limited by resources, we are limited by resourcefulness." By limiting the RCD funding to a comparatively small amount, it actually forces the RCD pathway to form these critical partnerships. However, a steady line of funding does allow for multi-year planning and continuity, which is key to being able to rely on RCD pathway initiatives. This funding should come in some combination of Operations & Maintenance (O&M), Research, Development, Test, and Evaluation (RDT&E), and limited Procurement. Finally, over-and-above funding should also be permitted as a means to incentivize success of the RCD pathway. If and when specific RCD initiatives are succeeding and accelerating specific capability development, that momentum should be further built upon and rewarded with increased investment.

Many of these characteristics are allowable within current service authorities, but there remains vast disparity between the services RCD efforts and very few of them make use of all five characteristics. Additionally, these efforts are being conducted in relative silos, largely independent of OSD coordination or focused investment. By aligning these efforts, OSD would be able to accelerate DoD-wide capabilities development. But that acceleration requires resourcing each service RCD pathway appropriately with authorities, key personnel, and investment. I compel this board to consider these recommendations as they relate to their own experiences in accelerating corporate innovation and how those practices might translate to the DoD services. Thank you for your valuable time.

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Comments submitted by a U.S. Army Colonel in the Office of the Under Secretary of Defense for Policy

Over the last 30 years the behavioral approach to researching decision making has blossomed, and over the last decade the Department of Defense has increasingly leveraged the behavioral approach to improve decision making - efforts found largely at the tactical level within the four Services. One important area has mostly fallen outside of this move towards improving decision making by using

behavioral approaches: senior defense and military leader decision making about strategy and policy. I acknowledge looking at elite decision making can be a challenging and touchy issue; however, the benefits to the Department of defense and the broader national security community could be substantial. A less challenging and contentious way to start improvements to elite decision making within the Department of Defense is to address the way the Department's many staffs - the Office of the Secretary of defense, the Joint Staff, the Services' staffs and the combatant commands' staffs - frame problems and develop strategies and policies for senior defense leaders. With this in mind, I would like the Defense Innovation Board to identify how to use behavioral approaches to decision making to improve military and defense staffs' formulation of defense and military strategies and policies.

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Comments submitted by a U.S. Navy Commander

The ATHENA Project was created onboard USS BENFOLD in 2012 - Led by Dave Nobles and a group of sailors who wanted to make BENFOLD and the Navy better by developing solutions to problems that Sailors see in the Navy - anything from developing new systems or retooling old systems, to new training plans, to fixing "broken" programs. By harnessing deckplate innovations and creating a cadre of forward-thinking, creatively confident Sailors, we are paving the way for the Fleet of tomorrow. Presenters have five minutes to pitch their idea, then the crowd votes on the ideas based on idea quality, actionability, and presentation. The winner receives the Admiral Sims Award for intellectual courage, as well as command backing, leverage of the ATHENA Network, and a small functional team to help make the idea become reality.

I've been a part of ATHENA since its inception, and while I should be a fan because of the programs, equipment, and TTPs ATHENA has generated, I am a fan for a much more selfish reason. As the Commanding Officer of USS BENFOLD, I encouraged my Sailors to participate and not only did they pitch amazing ideas, they became a more positive and productive workforce. When a sailor participates in ATHENA they spend time THINKING about their job and HOW to make the Navy better. This thought process leads to increased engagement and ownership - which is a WIN for any command!

Since my arrival in Japan I have tried to get an ATHENA chapter up and running in Yokosuka, however I have run into what Dave Nobles has termed "permafrost". This is the phenomena we have seen across the fleet when senior leadership does not support grassroots efforts, leaders down echelon do not endorse participation from their commands. Most Commanding Officers are uncomfortable with "different" or showing interest in something their boss has not openly endorsed. If DoD were to endorse more grassroots programs like The ATHENA Project we would undoubtedly benefit from a wealth of innovation across the technical and tactical spectrum.

I sincerely wish I were in DC to attend the open portion of the meeting as it is going to be a fascinating discussion.

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DEFENSE INNOVATION BOARD
PUBLIC COMMENTS RECEIVED IN ADVANCE OF 10/5/16 PUBLIC MEETING

Comments submitted by a U. S. Navy Petty Officer

In May 2016, I was invited to participate in the Athena Project, a Navy innovation conference, designed to build conversations and develop Sailors' ideas to make a better, more efficient Navy. The Navy has always been a diverse community, but by allowing an avenue for conversations, such as Athena, the Navy can tap into its potential. Sailors with unique educations, backgrounds, and experiences will drive innovation.

My idea, designing and purchasing body armor made specifically for women, won May 2016's Silicon Valley's Athena Conference Admiral Sim's Award for Intellectual Courage. Dr. Maura Sullivan, Chief of Strategy and Innovation, picked up on and carried my idea forward to the Pentagon, and in September 2016, I participated in a teleconference with the Pentagon's Office of Strategy & Innovation, discussing and highlighting the need for body armor designed for women. To engage fully with Sailors, the DOD must continue to allow a space where ideas can be presented and refined. Sailors enlist and commission from an amazing array of backgrounds, which, with well-organized opportunities, can help shape the Navy for the 21st century.

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Comments submitted by a U.S. Navy Lieutenant Commander

I volunteer as an Assistant Chair for the San Diego chapter of the Athena Project and would like to share the following comment with the DIB:

The ATHENA Project is an initiative focused on harnessing "deckplate-level" innovations to create a cadre of forward-thinking, creatively confident Service Members for an improving and evolving US military. The importance of the ATHENA Project revolves around it's open platform and forum for service members to pitch innovative improvements to their command and fellow service members, as well as leaders of industry, academia and government. ATHENA is holding quarterly pitch events in various military concentration areas as well as workshops, strategic focus gatherings, and mentoring programs. The openness of the ATHENA Project fosters a vital and emerging culture within the DoD of continuous development and improvement of solutions for better efficiency and mission effectiveness, while avoiding barriers commonly associated with traditional acquisition bureaucracy and purely proprietary solutions. Consistent with policy like the recently published Federal Source Code Policy the DoD and US Government as a whole needs more open platforms and forums to capture and cultivate the creativity and knowledge of talent at all levels of, and across organizations.

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Comments submitted by a U.S. Navy Commanding Officer

In anticipation of the Defense Innovation Board on 5 October 2016, I am sending my thoughts on the Navy's grassroots "Athena Project". I would like to see this effort become the template for future innovation endeavors.

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In April 2016, the first Navy Reserve-sponsored Athena Project was hosted in Silicon Valley. As a Commanding Officer, I encouraged my Sailors to participate because of the incredible value of fostering innovative thinking at the deckplates. My command of 16 full-time staff is responsible for ensuring the training and mobilization readiness of 275 Reserve Sailors who live and work in the Bay Area.   With increasing requirements and shrinking resources (including personnel), we are constantly striving to accomplish the mission with sustained customer service by working "smarter not harder". Athena Project gave me a way to keep my Sailors intellectually challenged in an environment of steady and repetitive tasks. It also gave us an outlet for thinking imaginatively and exploring possibilities.

Our winning pitch came from a female Master-at-Arms who described the need to make body armor that is designed for a woman's frame. She has gone on to pitch her idea for decision-makers at the Pentagon. But I think the most important outcome from the Athena Project at my command is that it has encouraged my Sailors to take ownership of their work environment. When they see areas of dissatisfaction, they are more likely to come forward with a recommended solution rather than just passively accepting it. Because the Athena Project has empowered them with a platform to share ideas and receive feedback, they are less afraid to try new ideas even if they fail. Failure is just a part of the learning process. For all these reasons and more, I give the Athena Project my highest endorsement as a tool for positive change at the deckplates--where it matters most!

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Comment submitted by six junior officers from multiple services; it was originally published as an article entitled "*An Open Letter to LT Kuriluk: We All Need to Hold the Military's Feet to the Fire*" in the *Best Defense* blog on ForeignPolicy.com on September 23, 2016

You, like us, are dissatisfied with the status quo in the defense enterprise. The problems facing our Department of Defense are many: an antiquated acquisition system, sclerotic talent management system, fragile strategic planning, and shapeshifting enemies ready to strike when we least expect it. But it is no longer enough to merely name these problems so that some sage on high will solve them on our behalf. In the words of our president, "We are the ones we've been waiting for. We are the change we seek." We invite you to join our ranks. We are a group of emerging military and civilian professionals who have dedicated ourselves to the service of our nation through reform from within.

We, too, see systemic flaws in military talent management and read with interest your letter to Best Defense. Many of us have similar stories, and even those who have succeeded within the personnel management system have seen the casualties of managing humans as undifferentiated pegs to be shoved into square holes. But while we sympathize with your frustration, we encourage you to channel it into positive action. We need brave men and women, like you, who are committed to action — not for themselves — but for something greater.

We know that we can make our military better, and that we do have agency. We challenge you to create your own agency and stand with us. There are many examples of men and women, young and old, who are already doing so.

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One such group committed to action is the Defense Entrepreneurs Forum. Since its inception in 2013, the DEF members have dedicated themselves to inspiring, connecting, and empowering emerging defense leaders to have an outsized impact within the national security arena. We come from different backgrounds, but we share a deep passion for solving daunting challenges.

As an example of how a small group of dedicated people can have an outsized impact, last summer, members of the DEF D.C. community were invited by the undersecretary of defense for personnel and readiness to make our voices heard. The task was to develop a comprehensive plan for building a future force: overcoming the failings of a bureaucracy that seemingly only changes in miniscule increments, reforming a frozen military personnel management system, and optimizing recruitment, development, promotion, and retention.

Without some grand flag officer decree or signed charter, a small group of committed professionals gathered in a room of the Pentagon to debate, discuss, and recommend solutions. The gathered group consisted of active duty and reserve, enlisted and officers, DoD and non-DoD civilians, think tank fellows and members, other government agency emerging leaders, and design-thinking facilitators. The room was strikingly absent the uniforms, parochialism, and structure by which so many Pentagon meetings are accompanied. Replacing them were passion, energy, and yes, a whole lot of sticky notes.

For a full day, participants applied design thinking tools to develop impactful, implementable solutions to problems. We wrestled with the same issues you take on in your letter. We analyzed talent management and professional development of both military members and civilians, questioned assumptions, and developed solutions — all with the purpose of creating a system which foremost improved the combat effectiveness of our Department and, in doing so, secondarily provided for the betterment of the individual.

This group of change agents broke down the false dichotomy of the military hierarchy versus the "selfishness of the millennial generation" and changed the narrative. After just one day conferring and two weeks writing on our own time, the group produced a 70-page report on the Force of the Future: From the Future Force (F5) that can be read in its entirety here. We captured ideas that had been proposed, discussed, iterated, and improved upon by people who care for over two years. DEF provided the ready network to quickly assemble a group to meet the time-sensitive need of a senior DoD leader.

Our conclusions reflected something you already know intuitively: that by leveraging both our people and technology, our force can be managed much better. Proper talent management can develop both satisfied team members AND a more effective team. This makes us more resilient to meet the unknown threats of the future.

This report was only the first of several subsequent opportunities for DEF members to put these far-reaching, yet well-considered recommendations directly into the hands of senior leaders. Just as important, it validated what a small group of committed individuals can do when empowered.

We feel your frustration. But ultimately, we shouldn't forget why we joined the service; for the greater good of our nation, not for ourselves.

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So, Lt. Kiriluk, we exhort you to use your Harvard education and leadership skills to make a difference for yourself, your team, and your service. Whether you do so within the Navy or through organizations like DEF, channel your frustration into change that is meaningful to you and the emerging leaders that only you can lift up in your wake.

Our problems are bigger than any single person or anecdote can ever describe. We have chosen to manifest our national service by becoming the change agents that will leave this hallowed institution in better condition than when we found it. Stand with us.

Signed,

CPT Jim Perkins, USA

Capt Chris Wood, USMC

Maj Miriam Krieger, USAF

Maj Kevin Kenney, USAFR

LT Roger Misso, USN

LT Chris O'Keefe, USN

The authors are involved in the Defense Entrepreneurs Forum and other ongoing efforts to improve warfighting and policy across the Department of Defense. This letter reflects their personal views, which are not necessarily those of the U.S. Army, the U.S. Marine Corps, the U.S. Air Force, the U.S. Navy, nor the Department of Defense.