

## DEFENSE INNOVATION BOARD

Open Meeting Minutes

October 5, 2016

9:30 AM to 11:00 AM

The Pentagon, Washington, D.C.

The Defense Innovation Board (DIB) is a federal advisory committee within the Department of Defense (DoD) operating pursuant to the Federal Advisory Committee Act of 1972, the Government in Sunshine Act of 1976, and other appropriate federal regulations. The DIB meets quarterly and held its first public session on October 5, 2016 from 9:30 AM to 11:00 AM in room B6 of the Pentagon Conference Center, The Pentagon, Washington, D.C.

### DIB Members (voting)(11)

Eric Schmidt (Chair)

Reid Hoffman

Eric Lander

Marne Levine

J. Michael McQuade

William McRaven

Milo Medin

Richard Murray

Jennifer Pahlka

Cass Sunstein

Neil deGrasse Tyson

### DIB Ex-Officios (non-voting)(0)

None

### DIB Staff Support (non-voting)(5)

Joshua Marcuse, Executive Director

Roma Laster, Designated Federal Officer

Nicole Bohannon, Major, USMC,

Military

Representative

Nicolas Lopez, Staff Assistant

Rudy Bonnette, Staff Assistant

### Public Session Attendees (112)

See Attached

## DEFENSE INNOVATION BOARD

### PUBLIC MEETING SESSION

At 9:30 AM, Ash Carter, Secretary of Defense, welcomed the DIB members and members of the public and provided opening remarks. At 9:38 AM, Roma Laster, Designated Federal Officer, opened the public session and welcomed the members of the public.

Mr. Joshua Marcuse introduced the Defense Innovation Board members and explained how to complete the form to request to speak to the Board at the end of the meeting, time permitting. He then introduced the Chair.

Dr. Eric Schmidt, DIB Chairman, thanked everyone for attending.

Dr. Schmidt explained that the DIB was created initiated in April and was still growing and in the research phase. After a series of preparatory visits to the Pentagon and other military installations, the Board concluded that they should identify approximately ten actions that the Secretary and DoD might choose to implement. He explained that the Board was tasked to look at technologies and capabilities, practices and operations, and people and culture. Additionally, he explained that innovation is not just about science and tech, it's really people and culture. He stated that in general, his impression is that there are lots of ideas, but no process for taking those ideas and turning them into a scalable innovation culture. Dr. Schmidt then asked Board members to share some of their initial observations, starting with Professor Sunstein.

Professor Sunstein introduced the idea that the Department should have a Chief Innovation Officer appointed by the Secretary to coordinate, oversee, and synchronize innovation activities across the Department, serve as a champion for innovation, and lead capacity-building efforts to promote innovation in the workforce. Working with relevant officials in the Department, the Chief Innovation Officer should (a) design a template for innovation and set of principles that could be broadly applied; (b) establish a program office to build capacity to spur workforce-driven innovation, such as innovation tournaments and educational activities; and (c) launch a Defense Innovation Network, an internal technology platform for information-sharing, rapid incorporation of the best available innovations, and crowdsourcing.

Ms. Marne Levine identified a need for the Department to establish a career track for computer scientists in the military that is intended to provide incentives for service members to specialize in computer science and programming fields, to get the additional training and opportunities they require to advance, and protect them from pressures to rotate into unrelated roles. To attract Science, Technology, Engineering, and Math (STEM) talent to this cadre, the Department should establish a Digital Reserve Officers Training Corps (ROTC) program that would attract promising undergraduate and graduate students in computer science, engineering, and related fields to commit to military service for a period of time in exchange for scholarships or debt relief. These recruits should have recruiting standards and training that is tailored appropriately to their unique role.

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Mr. Milo Medin proposed that U.S. Cyber Command, working in coordination with the National Security Agency, should conduct regular security reviews of embedded software and networks for weapons systems to identify vulnerabilities. The DoD should require that source code for such systems be made available on an ongoing basis for such testing, and that any detected vulnerabilities are removed. The DoD should identify new standards and practices to eliminate system vulnerabilities, particularly those that require collaboration between DoD and the defense industry. The Board will also propose recommendations for accelerating the rate of software updates to weapons systems.

Chancellor McRaven highlighted the need to improve the speed and timeliness of acquisition processes by increasing the use of available mechanisms for waivers and exemptions, and by offering incentives for quick resolution of concerns. Additionally, he suggested that DoD identify and broaden the use of “best practices” by specifying aspects of acquisition approaches and techniques that are effective in the Special Operations community that could be applied more generally.

Dr. McQuade identified the need to establish an institute for studying artificial intelligence and machine learning. Like the institutions established in the past to ensure DoD’s technological advantage in nuclear weapons, DoD now needs a centralized, focused, well-resourced organization to propel applied research in artificial intelligence and machine learning. This institute would coordinate research in these areas across the Department, and liaise with other labs in the private sector and universities, and would also conduct educational efforts to inform the Department about the implications of these advances for the Defense enterprise.

Mr. Hoffman suggested that the Department establish an embedded software development team of government employees -- a “human cloud” of computer programmers and software developers owned by the commander -- who are available on-demand to swiftly solve software problems by working directly with the owner of the requirement. Small teams of these developers should be assigned to commanders to provide an organic, on-demand resource that is immediately responsive to warfighter needs without necessitating writing a requirement, selecting a vendor, reaching back to a distant resource, or going through lengthy and onerous approval processes.

Dr. Murray explained how in the university setting, students are able to quickly take ideas and turn them into prototypes by utilizing open-source software, modern computing environments and the network of services available to them. Through internships and other experiences, they bring different approaches to the way to think about problems and challenge assumptions. Autonomy is an area that’s moving fast. The challenge is to reflect on how the Board could bring to the Department the culture and experience gained from corporations and universities from rapid prototyping, open-source software, and the rapid ability to prove new technologies in sensing, computation, networking, and machine learning.

Dr. Lander proposed the Department should build a culture of evidence-based, outcome-driven policies and experimentation by (a) testing multiple strategies simultaneously and using evidence to assess them; (b) testing different operational approaches in real time to accelerate learning; (c) creating opportunities to incorporate diverse viewpoints into decision-making processes; (d)

## DEFENSE INNOVATION BOARD

offering bonuses, recognition, awards, and other incentives for managers who promote innovation, give employees greater voice, and encourage creativity and divergent views.

Ms. Pahlka described her thoughts on world class digital talent and practices within government, not only recruiting from outside to get different practices, but building a pipeline to develop internal talent from inside and outside the department. It is important to identify and support those who are already doing innovation. The maker movement is also happening around the country and certainly in the military as well. She described her personal interest, as a member of the Board, in shortening the distance between those innovations and institutionalizing them.

Dr. Tyson described his perspective of the public's appetite for scientific and technology discovery. He discussed a shift from previous generations in the next generation's level of scientific literacy and technological savvy and curiosity that is without precedent in previous generations. He proposed that a sense of innovation and the role science and technology plays is now a part of our culture and not just reserved for the "geek subset" demographic.

Chancellor McRaven suggested that, based on his experience with the DoD bureaucracy, the Board needs to provide the Secretary with an elegant solution to innovation, the initiatives will die. Similarly, if the solution is too complex or spread too broadly, DoD will have difficulties in incorporating them.

The Board discussed acquisition limitations, identifying that it was an area that required more analysis. The initial impression of the Board is that the authorities to be more flexible existed, but that the incentive was less obvious, possibly a result a shift toward acquisition expertise rather than technical expertise in the acquisitions process.

The Board concluded their discussion with remarks about their impression that DoD is using an outdated model of computing and the relationship between innovation and risk. The question posed by the group was how to handle risk in an intelligent way by looking at the link between risk, experimentation, and iteration as the keys to innovation.

### PUBLIC COMMENTS

Mr. Marcuse opened the floor to public comments to the Board.

Mr. Jim Perkins addressed the board, however comments were inaudible on the video of the session and, therefore, not captured.

Mr. Chris O'Keefe addressed the issue of talent management and "the DoD innovation asterisk," the perception that DoD is always an exception regarding innovation because of restrictions DoD puts on itself. He suggested that removing the DoD innovation asterisk would be helpful and enable faster forward movement.

Ms. Elizabeth Prescott expressed excitement for her organization within National Defense University to work collaboratively across DoD in support of the Board's recommendations.

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Dr. Bill Doe addressed the talent management challenges presented by the Board, expressing concern that the DARPA young faculty award is not expansive enough and that the Department needs to ramp up its investment.

Mr. Andreas Mueller addressed the board to highlight the Defense Innovation Unit Experimental and inquire whether the Board was aware of the organization and/or had been in contact with them.

Dr. Igor Fridman commented that it is difficult to be sure that they (DARPA) are focusing on the right problems and that the Board could inject innovation in the R&D enterprise.

Mr. Modigliani addressed the acquisition enterprise and its lack of experience required for navigating/building complex systems

Mr. Andrew Hunter commented on risk in the acquisition process and explained that his organization is trying to figure out if there is a way for the Government and industry to take on risk that is sound for both.

Mr. Saad Ansari addressed three points: 1) DoD is innovating in a legacy sector and there is cost to retiring legacy systems; 2) DoD makes decisions based on things which happened in the past and may never happen again; and 3) in the past domestic and defense sectors were inextricably linked, but now there is a divide between them and maybe that specialization affects innovation.

Mr. Erwin Gody discussed program management's focus on building all program requirements up front and addressing iteration as changes, instead of iteration up front to get it right, then building the requirements.

Colonel Jeff Hannon commented on the decision-making of senior leaders which relies on uninformed expertise or expertise that is heavily contextualized and proposed looking at some sort of man/machine teaming to help take the burden off the decision maker.

Dr. Schmidt made closing comments.

END OF PUBLIC SESSION

ADJOURNMENT

Mr. Marcuse, with the concurrence of Ms. Laster, adjourned the DIB's October 5, 2016 public meeting session at 11:08 AM.

I hereby certify, to the best of my knowledge, the foregoing minutes are accurate and complete.



DEFENSE INNOVATION BOARD

Eric Schmidt, PhD  
 Chairman  
 Defense Innovation Board  
 November 17, 2016  
 PUBLIC SESSION ATTENDEES

| LAST NAME      | FIRST NAME     |
|----------------|----------------|
| Adkins         | James          |
| Aimone         | Michael        |
| Ansari         | Saad           |
| Bain           | Benjamin       |
| Baker          | James          |
| Balachander    | Puja           |
| Barry          | Patrick        |
| Baxter         | Caroline       |
| Benfield       | Paul           |
| Bertuca        | Tony           |
| Bew            | Richard        |
| Biggs          | Randall        |
| Blanks         | Julie          |
| Bramer         | John           |
| Brown          | Vicki          |
| Brown          | S. Alexia      |
| Chambers       | Samantha       |
| Cox            | Gregory        |
| Cully          | James          |
| Deane-Shinbrot | Steven         |
| Dixon          | Robert         |
| Doe III        | William (Bill) |
| Edgin          | Jennifer       |
| Erwin          | Sandra         |
| Fish           | Chris          |
| Flagg          | Melissa        |
| Fridman        | Igor           |
| Fuller         | Joan           |
| Galvin Jr      | James          |

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|                |             |
|----------------|-------------|
| Garrett        | Ronna       |
| Glickstein     | Daniel      |
| Godette        | Carole      |
| Grega          | Lawrence    |
| Hagerott       | Mark        |
| Hannon         | Jeffery     |
| Hartigan       | Kelsey      |
| Hayford        | Scott       |
| Haynes         | Peter       |
| Hicks          | Richard     |
| Hill III       | Gerald      |
| Holiday        | Maynard     |
| Holland        | Peter       |
| Holman         | Jason       |
| Hunter         | Andrew      |
| Jacky          | Joseph      |
| Johnson, III   | Theodore    |
| Jones          | Jack        |
| Kanter         | Noah        |
| Kenney         | Kevin       |
| Kirchhoff      | Christopher |
| Klimas         | Jacqueline  |
| Kostura        | Alexander   |
| Lane           | Edward      |
| Lautenschlager | Jerry       |
| Lewis          | Melissa     |
| Licklider      | Christy     |
| Luehe          | Douglas     |
| Lynch          | Chris       |
| Macaranas      | James       |
| Marshall       | Robert      |
| Martin         | Brandon     |
| Martinez       | Gilbert     |
| Matthys        | Shawna      |

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|            |                   |
|------------|-------------------|
| McAvoy     | Brian             |
| McCullough | David             |
| Miller     | Alex              |
| Mitchell   | Charles (Charley) |
| Montgomery | Evan              |
| Mueller    | Andreas           |
| O'Brien    | Kathleen          |
| O'Keefe    | Ashley            |
| O'Keffe    | Christopher       |
| Parziale   | Jacqueline        |
| Perkins    | James             |
| Pines      | Daniel            |
| Porkolab   | Imre              |
| Prescott   | Elizabeth         |
| Rafnson    | Gary              |
| Ramsden    | April             |
| Reist      | David             |
| Richman    | Kevin             |
| Robles     | Justo             |
| Rochester  | Patricia          |
| Rodeman    | Christopher       |
| Rutkoff    | Becca             |
| Sagana     | Renelle           |
| Saxe       | John              |
| Scales     | Will              |
| Scanlon    | Kelly             |
| Schumacher | Aaron             |
| Shah       | Raj               |
| Sherman    | Jason             |
| Sinacore   | Brian             |
| Thome      | Alexander         |
| Trimble    | Paula             |
| Trimble    | Kathy             |
| Virgo      | Wilton            |



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|           |             |
|-----------|-------------|
| Visotsky  | Michael     |
| Wade      | Sarah       |
| Waltz     | Michael     |
| Werko     | Robert      |
| Williams  | Brian       |
| Winkleman | Adam        |
| Wood      | Christopher |
| Zakon     | Robert      |
| Wright    | Mark        |
| DeLong    | George      |
| Koch      | Thomas      |
| Licklider | Christy     |
| Krieger   | Miriam      |
| Lewis     | Melissa     |
| Campbell  | Garrett     |