

DEFENSE INNOVATION BOARD

Open Meeting Minutes

April 26, 2018

2:35 PM to 4:44 PM

Broad Institute, Cambridge, MA

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 seventh public session on April 26, 2018 from 2:35 PM to 4:44 PM in the auditorium of the Broad Institute in Cambridge, MA.

DIB Members (voting)(8)

Dr. Eric Schmidt (Chair)  
Dr. Richard Murray  
Dr. Eric Lander  
Dr. J. Michael McQuade  
Mr. Milo Medin  
Ms. Jennifer Pahlka (Telephonically)  
Ms. Marne Levine (Telephonically)  
Mr. Walter Isaacson (Telephonically)

DIB Staff Support (non-voting)(5)

Mr. Joshua Marcuse, Executive  
Director  
Mr. Michael Gable, Alternate  
Designated Federal Officer  
Mr. Nicolas Lopez  
Mr. Aaron Schumacher  
Ms. Courtney Greenley

Guest Presenters (6)

Lt Gen Lee Levy, Commander, U.S. Air Force  
Sustainment Center, U.S. Air Force  
RADM David Hahn, Chief of Naval Research,  
U.S. Navy  
Dr. George Duchak, Deputy Assistant  
Secretary of Defense, Command, Control,  
and Communications, Cyber, Business  
Systems (C3CB), Under Secretary of  
Defense for Acquisition and Sustainment  
(USD(A&S))  
Col Mike McGinley, Defense Innovation Unit  
Experimental (DIUx) Boston, U.S. Air Force  
Ms. Jen Edgin, Chief Technology Officer,  
Intel Division,  
Capt Bryon Kroger, Chief Operations Officer,  
Kessel Run, U.S. Air Force

Public Session Attendees (319)

Livestream Participants (114)

Public Commenters (9)

Mr. Brandon Hanks  
Mr. Greg Ingram  
Mr. Beau Young  
Mr. Mike Duggan  
Mr. Matt Merighi  
Ms. Jenness Simler  
Ms. Charlene Stokes  
Mr. John Connolly  
Mr. Jeremy Kriegel

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### PUBLIC MEETING SESSION

At 2:34 PM, Mr. Michael Gable, Designated Federal Officer (DFO), opened the public meeting and welcomed the members of the public and those joining over livestream and over the telephone.

Dr. Eric Lander welcomed the guests to the Broad Institute, adding how delighted he was that the DIB chose to host its meeting in an innovation hub like Boston, MA. He gave a brief overview of the DIB's mission and expressed his pleasure in seeing how receptive the Department (DoD) has been to ideas and the hunger for innovative solutions. Dr. Lander thanked participants for attending and turned the meeting over to the Chairman, Dr. Eric Schmidt.

Dr. Schmidt thanked Dr. Lander and said that the Broad Institute is one of the great American institutions in terms of impact on people's lives. He commented on the federal government's impact in general research at MIT, Harvard, and the Cambridge, MA area. He recounted that the DIB has visited several U.S. military installations during the past couple years and provided advice to the Department through past recommendations. For example, he said the Board recently visited the Army Capabilities Integration Center at Fort Eustis and the U.S. Air Force 480<sup>th</sup> Intelligence, Surveillance, and Reconnaissance Wing at Langley Air Force Base. He also mentioned a trip to Fort Worth, Texas, in which the Board learned about the U.S. Air Force's software challenges during a visit to Lockheed Martin's F-35 production facility. He closed by saying that the goal of these kinds of site visits and field research is "to do something – to do things that are actionable through recommendations." He then turned the meeting over to DIB Executive Director, Mr. Joshua Marcuse, to introduce the meeting agenda.

Mr. Marcuse introduced the DIB members, thanked the Broad Institute staff for hosting the event, and outlined the agenda for the meeting, which was themed around software. Mr. Marcuse then turned the meeting over to the first speaker, Lieutenant General (Lt Gen) Lee Levy, Commander, U.S. Air Force Sustainment Command, U.S. Air Force.

Lt Gen Levy began by acknowledging the complexity of software acquisition, including how the Department acquires and sustains software. As the commander of the U.S. Air Force Sustainment Center, he described the responsibilities of his organization. He noted that his command has 4,000 software professionals but cautioned that software goes beyond weapons systems. He highlighted the success of the Defense Innovation Unit Experimental's (DIUx) upgraded tanker aircraft refueling planner, and explained how DoD does not have a funding stream that goes across multiple years and blends multiple colors of money into one stream of funding. Lt Gen Levy concluded by suggesting that DoD would be better positioned to win future wars if the Department's acquisition requirements process reflected the iterative lifecycles of modern software development.

Dr. Schmidt thanked Lt Gen Levy for his remarks.

Mr. Marcuse continued the discussion and introduced the next speaker, Rear Admiral (RADM) David Hahn, Chief of Naval Research, U.S. Navy, noting the positive impact of the generals and

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admirals, such as RADM Hahn, who serve as liaisons between the Board and the Services.

RADM Hahn briefly discussed the history and role of the naval research enterprise. He stated that the same formula that delivered outcomes post-WWII are not delivering the results required for today's security environment. He agreed with Lt Gen Levy's sentiment that DoD's acquisition process is not necessarily operating in an optimal way. Recognizing this problem, he said U.S. Navy leadership stood up and accelerated a set of initiatives around acquisitions. He listed a few examples, including an unmanned tanker program, the MQ-25, and directed-energy weapons that are moving at a pace that DoD's acquisition system does not recognize as possible.

RADM Hahn also highlighted the funding cuts for Sea Wolf, a class of nuclear-powered attack submarines, as a watershed moment for the submarine force, propelling them to operate differently. He said it forced them to adopt a model of continual software development and requirements definition, stable funding across all the colors of money, and user interaction across the whole lifecycle. RADM Hahn thanked the Board and then turned the meeting back to Mr. Marcuse.

Mr. Marcuse introduced Dr. George Duchak, DASD (C3CB), USD (A&S), and invited him to speak.

Dr. Duchak began by thanking the Board and giving a brief overview of his background. His presentation focused on three topics in terms of Department's approach to software: mental models (i.e. organizational culture), talent, and incentives. He continued to say that DoD is no longer in the industrial age but rather in the information age where old rules of supply-side economies of scale and a "production mentality" do not prevail. Therefore, the organizational culture within DoD must change and promote a continuous software development and sustainment model. Regarding talent, he suggested that the Department's civilian career classification code needs to change to meet emerging technological needs in software engineering and data sciences. He concluded with a discussion around constructing incentives that align the right behaviors of the workforce, government, and industry partners to achieve desired outcomes, including faster time to market and more secure and affordable software capabilities. He closed by reiterating how glad he is to work with the DIB and turned the meeting back to Mr. Marcuse.

Mr. Marcuse thanked Dr. Duchak and introduced Colonel (Col) Mike McGinley, DIUx Boston, U.S. Air Force.

Col McGinley briefly introduced himself and DIUx Boston. He focused on three points about how the Department could attract new talent: get scrappy, get connected, and get inspired. He first recommended that DoD create a culture that is made of scrappy, determined people. Second, he urged the Department to seek out these people, recruit them, and bring them into the broader DoD mission by engaging with them consistently. He briefly discussed his "Cambridge mafia" model that connects local university students with DIUx to work on various projects. Third, he suggested that DoD needs to actively present the unique problem sets the Department has to offer in order to inspire more people to join the mission. Col McGinley then thanked the Board and turned the meeting back to Mr. Marcuse.

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Mr. Marcuse thanked Col McGinley. He then transitioned to the U.S. Marine Corps (USMC), highlighting how they have tackled critical information and data needs by creating a Deputy Commandant for Information position. He then introduced Ms. Jen Edgin, the USMC's Intelligence Division Chief Technology Officer as the next presenter.

Ms. Edgin began by asking the audience to imagine a Marine operating in a new information domain and the possible challenges that come with it. To address the software problems, USMC decided to start an accelerator with the goal of identifying and solving problems quickly. To do so, USMC had to operate differently in the accelerator. The program created a rank-less environment and asked Marines to dress in t-shirt and jeans. In addition, they taught and implemented lean start-up principles and design thinking tools. Marines were asked to get out of the building, crowdsource with their peers, then go back to their home organizations and solicit feedback. At the end of the 12-week cycle, the Marines pitched their minimally viable product to general officers for a release decision. Ms. Edgin commented on how captivating it was to see Marines empowered to solve their own problems. To note, 100 percent of the accelerator attendees found it to be a value-added experience and 100 percent of attendees would recommend it to a friend. She concluded by noting that the USMC is now looking at how to scale this process to other domains and functions. Ms. Edgin then concluded her remarks by thanking the Board.

Mr. Marcuse thanked Ms. Edgin and introduced Captain (Capt) Bryon Kroger, Chief Operations Officer, Kessel Run, U.S. Air Force.

Capt Kroger sought to focus on the bigger picture – the fact that software is leading the world and war. To start, he listed some of his team's accomplishments to date. For example, his team was able to award a contract with DIUx in 60 days which allowed them to deploy a classified commercial cloud platform in 60 days, followed by two classified production environments and commercial cloud infrastructure and platform in 130 days. In addition, they were the first Departmental organization to establish true, continuous software delivery on DoD's classified network, SIPRNET.

Next, he discussed the drivers behind this success. He explained that learning fast requires fast feedback loops, and the key to that in the software world is continuous delivery. He believes some of the biggest reasons DoD struggles with continuous delivery is that it has a culture problem and an architecture problem. On the architecture side, commercial infrastructure and platform as a service should be the prerequisite for software delivery outcomes. Through partnership with Pivotal Labs, he learned that it is not just about the agile software development, but also about a whole balanced team of lean product management, user-centered design, and pairing Airmen with software developers from the commercial industry side-by-side. He emphasized that there's no talent shortage but rather a shortage of environments where Airmen with a growth mindset can thrive, learn, and feel safe to do so.

Capt Kroger also echoed the Board's sentiment that DoD doesn't have an innovation problem but rather an innovation adoption problem. He discussed the importance of psychological safety for growth. To close, Capt Kroger announced that Kessel Run was moving out of Pivotal Labs

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and into their own facility at WeWork in downtown Boston, MA. He called on the U.S. Air Force and DoD to invest in environments where learning can thrive, then turned the meeting back to Mr. Marcuse.

Mr. Marcuse thanked Capt Kroger and transitioned the meeting to Ms. Bess Dopkeen, the lead for the Board's Software Acquisition and Practices (SWAP) study.

Ms. Dopkeen introduced herself and provided an overview of the SWAP study's congressional mandate. The study aims to provide the Department and Congress with suggested statutory and regulatory changes, as well as suggestions for new legislative and policy proposals to modernize and streamline the Department's software acquisition processes, and identify organizational and cultural process gaps.

Ms. Dopkeen then noted that the Department lacked strategic, enterprise-wide data collection and analysis. She said the SWAP study will investigate this issue through user interviews, case studies, literature reviews, data analysis, and agile pilots. The data analysis portion will consist of two parts – using modern data analytics tools to provide new insights into DoD's software acquisition process, and language analysis tools to help sift through piles of regulations affecting the software acquisition system. The study's final report is due on April 5, 2019.

Ms. Dopkeen then reviewed the ten "software commandments" which will serve as the Board's an initial report to Congress. That said, she noted that some challenges still exist: the Trade Secrets Act and contracting process both add time and barriers for the study. Furthermore, the Department does not have a vast amount of software acquisition data because it never strategically collected it. Ms. Dopkeen concluded by noting that Ms. Ellen Lord, Under Secretary of Defense for Acquisition and Sustainment (A&S), is fully invested in this study and is committed to this effort. Ms. Dopkeen then turned the meeting back to Mr. Marcuse.

Mr. Marcuse called on Dr. Michael McQuade and Dr. Richard Murray to continue the discussion from the perspective of the Board.

Dr. McQuade thanked Ms. Dopkeen and expressed his hopefulness in the study. He then asked those in the audience who work in software to raise their hands which resulted in a small number of hands. Dr. McQuade then asked those with their hands raised to keep their hands up until he said something that was not true about how they did software. Dr. McQuade said the first thing the Department does is think about the problem (no hands went down). The second thing the Department does is spend an enormous amount of time getting the requirements right (all hands dropped except for two). The third thing the Department does is agree on all the requirements (one hand remained up). Dr. McQuade then continued on a list of things the Department does in its software acquisition process. Eventually, no hands remained, and Dr. McQuade suggested that the Department's software acquisition should not continue to be executed under its current practices. He said the best way to do software is to incrementally improve the software as the needs progress. He then discussed how the SWAP study would categorize different types of software: commercial off-the-shelf software, commercial software that requires some customization, custom software that runs on commodity hardware, and custom software that runs on custom hardware. Dr. McQuade then turned to Dr. Murray for his comments.

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Dr. Murray began with a discussion on the Board's ten commandments of software: (1) Make computing storage and bandwidth abundant to DoD developers and users; (2) Software procurement programs should start small, be iterative, and build-up and terminate quickly; (3) Budgets need to be constructed to support the full life cycle cost of software, with the amount of that budget proportional to the criticality and utility of that software; (4) Adopt a "DevOps" culture; (5) Automate testing of software to enable critical updates faster; (6) Every purpose-built DoD software system should include source code as a deliverable; (7) Every DoD system that includes software should have a local team of DoD software experts; (8) Run only operating systems that are receiving and utilizing regular security updates for newly-discovered security vulnerabilities; (9) Data should always be encrypted unless it's part of an active computation; and (10) All data generated by DoD systems in development and deployment should be stored and made available for machine learning. Dr. Murray then turned the meeting over to Dr. Schmidt and the rest of the Board for comments.

Dr. Schmidt proposed an additional commandment to count the actual number of programmers, noting that often times the people meeting and deliberating on a software issue are not programmers.

Mr. Medin responded that part of the problem is the different contractors that work on different systems. Dr. Schmidt commented that he is simply suggesting a headcount before differentiating contractors.

Dr. Murray raised the issue that there is no career classification code that differentiates programmers from data scientists to which Dr. Schmidt responded that without programmers, the Board cannot deploy the ten commandments. Dr. Murray agreed on that point. Dr. McQuade agreed as well and stated the potential eleventh commandment: "real coders write real code – how many are there?"

Mr. Medin suggested adding "abundant compute programmers" to the first commandment.

Dr. Schmidt then asked the Board members on the phone for comments but received no reply.

Mr. Medin continued to discuss the issue with abundant compute, specifically addressing the lack of bandwidth at the Department and the seemingly irrational amount of capability the Department receives for the amount it spends on IT. He urged the Department to think about unit cost and manage to a commercial reduction year-to-year.

Dr. Lander asked which commandments will face the most active opposition. If the commandments are to stick, the Board must understand the failure modes of each.

Dr. McQuade answered that the budget (3) and source code (6) commandments are the hardest, given that source code is the economic livelihood of what private sector can provide.

Dr. Schmidt asked to clarify whether Dr. McQuade was saying the budget needs to reflect how the system allocates cost. Dr. Murray then added that stating "software should be procured

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differently than hardware” may be a better way to start that commandment.

Dr. Schmidt added that the commercial sector has a lot of experience on how to budget for software but DoD does not have the same approach. He continued on the source code issue, specifically that it would be a license to see the source code rather than a transfer of intellectual property.

Dr. Murray discussed the different aspects of source code ownership and whether DoD should be allowed to modify it.

Mr. Medin added that testing will be another hard issue. Testing needs to keep up with software development, specifically the baseline compute evolution needs to keep pace with the software. As an example, he noted that the F-22's .6-MIP onboard computer has less compute power than a cell phone.

Ms. Levine (on the phone) concurred with the ten commandments and underscored the second commandment. Particularly, focusing on: the need for simple solutions for user needs; solving without over engineering; and constantly testing and learning. On the fourth commandment, she reiterated the importance of psychological safety as part of adopting a “DevOps” culture.

Dr. Schmidt thanked Ms. Levine. Dr. McQuade asked Ms. Jennifer Pahlka to comment.

Ms. Pahlka affirmed Ms. Levine's point on psychological safety and reiterated Capt Kroger's sentiment that DoD's lack of software talent pool is a problem.

Dr. Schmidt thanked Ms. Pahlka for her comments and said the first commandment could have an addition to clarify the problem.

Dr. McQuade reiterated the Board's recommendation to establish computer science, computer engineering, and programming as core competency disciplines within DoD. Furthermore, to the maximum extent possible, DoD should use commercial software for business processes. Lastly, he stated that DoD should move to a model of continuous hardware refresh cycle of 2-3 years.

Mr. Medin also added that as the technology cycle gets faster, the Department will have to pay increasing amounts of money to keep obsolete parts in production to support old legacy systems.

With that, Dr. Schmidt called for a vote on whether everyone is in favor of continuing the process and turning the commandments into a more formal report to Congress. The Board unanimously voted “yes.” Dr. Schmidt then turned the meeting over to Mr. Marcuse.

Mr. Marcuse asked the audience to submit comment cards and transitioned into an update on the Department's latest implementation of the Board's recommendations. He highlighted a few specific areas, including the USMC Installations and Logistics Symposium, the U.S. Air Force Life Cycle Management Center's work on talent management, the U.S. Air Force Personnel Center's pilot program to link talent to new job opportunities, the establishment of a Joint Artificial Intelligence Center, Carnegie Mellon University's software expertise support with the

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F-35 program, the Defense Digital Service's "Industry Day" for the Joint Enterprise Defense Infrastructure contract, and the U.S. Air Force's newly created Chief Data Officer position. He then announced that the next public meeting will be on July 11, 2018 at DIUx in Mountain View, CA.

Mr. Marcuse then transitioned to the public comment portion of the meeting.

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### PUBLIC COMMENTS

Mr. Brandon Hanks, a developer for MIT, had two comments. First, on the four different types of software, noting that open source was not mentioned. Second, if the commandments cannot be applied universally, then they might not be commandments.

Mr. Greg Ingram, Director of Business Development at an AI startup in Cambridge, wanted the Board's thoughts on the DIUx model and how to expand that. He wanted to get a sense of what the Board is trying to push in order to get those processes down at the lower levels of other agencies that are doing R&D and executing prototype funding.

Major General (MG) James Young, U.S. Army Reserve, updated the Board on the 75<sup>th</sup> Innovation Command, which will be a nationwide command of approximately 1,500 personnel whose role is to take advantage of the private sector expertise, talent, and culture within the U.S. Army Reserve. Its goal is to create a command that's essentially a distributed network of small teams designed to partner with government agencies as well as private sector organizations to bring private sector innovation and technology into the DoD faster. The command is partnered with U.S. Army Futures Command and should be at initial operating capability this summer with full operating capability next summer.

Mr. Mike Duggan from Booz Allen Hamilton frequently works with the U.S. Air Force and asked for one of the commandments to talk about "DevSecOps" as a baseline for tools.

Mr. Matt Merighi from the Fletcher School of Law and Diplomacy affirmed the Board's discussion on software. He mentioned foreign military sales as a complication that the Board should consider, as he used to work in that industry for APSIA (Associate of Professional Schools of International Affairs) before attending the Fletcher School. He further explained that it is already a complicated process in terms of getting existing off-the-shelf technology from the U.S. sold out of the country and becomes more complicated when countries want changes to the hardware. Furthermore, he said complications will exist on the contracting side as well.

Ms. Jenness Simler from the Boeing Company suggested, regarding the sixth commandment, that the Board should flesh out the business models for pricing hardware and software in order to stimulate creative thinking for both policymakers and industry. In addition, the Board should explore how the existing statutes and regulatory framework regarding competition throughout the life cycle of a program also plays into industry's willingness to partner.



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Ms. Charlene Stokes with the MITRE Corporation commented on selection and training and that changing a culture is an iterative process. Regarding Col McGinley's comment on incentivizing and acquiring individuals, she thinks it really comes back to starting at the very beginning, even with K-12 initiatives.

Mr. John Connolly suggested that the ten commandments could address how to make it easier for industry to get software into the government. Specifically, he suggested DoD take ownership for certifications so that there is not a full recertification effort every time industry tries to work with the Department.

Mr. Jeremy Kriegel from the Broad Institute was very encouraged by what he heard today. He wondered if the Department should leapfrog the process by innovating and discovering the next generation of product development best practices.


Dr. Schmidt made closing comments.

END OF PUBLIC SESSION

ADJOURNMENT

Mr. Marcuse, with the concurrence of the DFO, adjourned the DIB's April 26, 2018 public meeting session at 4:44 PM.

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

  
Eric Schmidt, Ph.D.  
Chairman, Defense Innovation Board

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### PARTICIPANT LIST:

Joseph Aghia	Haiqi Chen
Sunny Ahn	Jennifer Chen
Alina Ainbinder	Michael Chieh
David Altschuga	Kirby Chin
David Altschuler	Gina Ciolek
Ian Andrews	Matthew Clarkin
Balint Antal	Leigh Cockburn
Rhian Anthony	Katie Collins
Hugo Arellano	Eamon Comer
Samira Asgari	John Connelly
Brandon Avila	Oliver Cooper
Ernie B.O.	Veronica Coulon
Christian Bailey	Vanessa Couturier
Sara Balch	Alex Cuadros
Blaine Barnard	Michael Cuoco
Lindy Barrett	Clifton Dalgard
Alex Baumann	Brian Daniels
Brian Beachkofski	Khajanovia Dautry
Ashton Berger	Chris Davis
Lars Bernard	Katherine DeRuff
David Bernick	Laura Doherty
Peter Berube	Mo Dorman
Jeff Bessen	E Drobhyushy
Nikhil Bhargava	Peter Du
Christa Blomquist	Fabiana Duarte
Heather Boesch	George Duchak
Zolton Boka	Michael Duggan
Jeff Boleng	Patrick Duggan
Kevin Bonham	Jaymie Durnan
Mark Bruington	Shawn Egri
Jordan Bryan	Oana Enache
Philip Budden	Matt Epperly
Jim Bullion	Nikolai Eroshenko
Tara Burke	Nina Farrell
Christopher Cadigan	Henry Ferrara
Byron Callan	Melissa Flagg
Anita Carleton	Larry Fletcher
Tyler Caron	Steve Foote
Maren Cattonar	Holly Foskett
Bridget Chak	Cara Fraley
Alina Chan	Catherine Freije
Eric Chase	Iris Fung
Gabrielle Chefitz	Luke Funk
Fiona Chen	Adam Furtado
	Victoria Galvin
	Galen Gao

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Riaz Gillani  
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Adam Goobic  
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Robert Green  
Anna Greka  
Shari Grossman  
Gail Guo  
Kane Hadley  
David Hahn  
Brendan Hanks  
Mafruha Haque  
Chris Harrison  
Douglas Hart  
Erin Hayde  
Poul Hebsgaard  
Vivian Hecht  
Sean Heritage  
George Herz  
Orn Hessfin  
Brandon Hicks  
Li-Lun Ho  
Zandra Holland  
Kara Holmquist  
Jagmohan Hooda  
Abby Hopper  
Yi-Hsiang Hsu  
Brian Hugelmeyer  
Brian Hurhula  
A.Z. Hussein  
Gregory Ingram  
Arvin Iracheta-Vellve  
Robbyn Issner  
Suzanne Jacobs  
Vanshika Jain  
Lauren Johnson  
Glen Johnston  
Andrew Jones  
Johanna Jones  
Vinay Kartha  
Tanveer Kathawalla  
Kevan Keegan

John Kennedy  
Danielle Kerins  
Gene Keselman  
Dmitry Khazanovich  
Christina Kirk  
Will Kirkman  
Jake Kloeber  
Jessica Klopp  
Eric Kofman  
Sara Kosmaczewski  
Kunal Kothari  
Bruce Kozuma  
Karen Krause-Bencal  
Jeremy Kriegel  
Matthew Krimm  
Lindsey Kroger  
Chuck Kubik  
Guillaume Kugener  
Vikram Kumra  
Dan Kurtenbach  
Rizwan Ladha  
Gwen Lamar  
Jen Lapan  
Daniel Leary  
Samuel Lee  
Soo Hee Lee  
Mitchell Leibowitz  
Maggie LeMaitre  
Evan Lemire  
Rachel Liao  
Charlie Lieu  
Emily Lipscomb  
Dimitri Livitz  
Anthony Losada  
Elton Lossner  
Irena Lucifredi  
Nicholas Lyons  
Brian Maher  
Renato Mancuso  
Deepak Mani  
Austin Manny  
Crystal Mao  
Remi Marengo  
Claire Margolis  
Scott Marr  
Nathan Mathewson

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William Mayo	Irfan Piric
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Michael McCord	Damian Plichta
Matt McCrann	Greg Polumbo
Pam McDonald	Blake Poole
Lee McGuire	Christopher Preston
Margaret McKenna	Alexis Prest-Simpson
Robert Meffan	Megan Purdum
Nehal Mehta	Leanne Quinn
Josh Mendelsohn	Sean Quirk
Matthew Merighi	Pavel Rabinovich
Mariela Mihaleva	Jennifer Ricklin
Christos Miliotis	Manuel Rivas
Ian Miller	Sergio Rodriguera Jr
Arman Mohammad	Pete Roney
Linda Moineau	Noah Rose
Benoit Molinie	Jordan Rossen
Padraig Moloney	Olivia Rowe
Monica Montesinos	Tim Rudolph
Kate Mulherin	Oliver Ruebenacker
James Mullahoo	Thomas Ryden
Fiona Murray	Ali Saaem
Patrick Murray	Andrea Saltzman
Partha Nag	Alexandra Sander
Bhavik Nagda	Christine Santoro
Vasant Nagda	Jean Santos
Raghu Nandan	Michael Scollo
Waseem Naqvi	Douglas Scott
Anjali Nath	David Segal
Celina Nguyen	Rishi Shah
Abdifatah Omar	Joy Shanaberger
April O'Neil	Tahaz Sharifria
Brenda Oppermann	Jian Shu
Joseph Ordovas-Montanes	Jeness Simler
Dale Ormond	Sean Singleton
Enrique Oti	Jonathan Smith
Lynn Pais	Matthew Solomonson
Won Palisoul	Ryan Spangler
Daniel Palmieri	Wes Spurlock
Kerri Paquette	Chip Stewart
Riya Patel	Charlene Stokes
Nikolaos Patsopoulos	Conrad Stosz
Chris Perrine	Christine Strand
Heidi Perry	Dan Sturtevant
Ross Perry	Ellen Sukharevsky
Greg Phillips	Saul Tannenbaum

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Matt Tegtmeyer  
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David Thomas  
Grace Tiao  
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Mihir Trivedi  
Aviad Tsherniak  
Craig Ulsh  
Nicholas Van Wittenberghe  
John Vandenbenden  
Luk Vandenbergh  
Zeovo Vibiry  
Andy Vidan  
Marcin Von Grotthuss  
Justin Voog  
Paul Voosen  
Jennifer Voss  
Kate Voss  
Gordon Wade  
Marc Wadsworth  
Carrie Wager  
JJ Walcutt  
Luke Wallace  
Mark Wallace  
Julia Walter  
Lauren Walter  
Allie Warren  
Andrew Weinert  
Susan Weisenburger  
Nicole Williams  
Clay Williamson  
Christopher Wilson  
David Wine  
Clark Wood  
Alec Wysoker  
Zhang Xuozhi  
Sanjeev Yadav  
Kayla Yates  
James Yearsley  
James Young  
Jeffrey Yu  
Aina Martinez Zurita

