

National Security Commission on Artificial Intelligence Public Minutes of Commission Meeting

Day 1: Monday, January 25, 2021 – 12:00pm – 3:00pm EST

Location: Video Teleconference

ATTENDANCE

Commissioners Present:

- Dr. Eric Schmidt, Chairman
- Hon. Robert Work, Vice-Chair
- Ms. Safra Catz
- Dr. Steve Chien
- Hon. Mignon Clyburn
- Mr. Chris Darby
- Dr. Ken Ford
- Dr. Eric Horvitz
- Mr. Andy Jassy
- Mr. Gilman Louie
- Dr. William Mark
- Dr. Jason Matheny
- Hon. Katharina McFarland
- Dr. Andrew Moore

Commissioners Not Present:

- Dr. José-Marie Griffiths

Staff Present:

- Yll Bajraktari, Executive Director
- Michael Gable, Chief of Staff, Committee Management Officer
- Angela Ponmakha, Designated Federal Officer
- Michael Lueptow, General Counsel
- Tara Rigler, Director, Strategy, Communications, and Engagement
- Commission Staff

AGENDA ITEM: CALL TO ORDER AND OPENING REMARKS

Ms. Ponmakha, as the Designated Federal Officer, called the meeting to order. In her remarks, Ms. Ponmakha noted that, due to a scheduling conflict, the Commission would move their discussion of Chapter 6 of the Final Report to the second day of discussion. Time allowing, Chapter 9 would move up and occur at the end of the first day.

Mr. Bajraktari, Dr. Schmidt, and Hon. Work, gave brief opening remarks.

AGENDA ITEM: INTRODUCTION & AI IN CONTEXT REVIEW AND DELIBERATION

Presentation of Proposed Introductory Sections

An NSCAI staff member provided an overview of the draft introduction to the Final Report..

An NSCAI staff member provided an overview of the introductory section, “AI in Context,” noting that the section is meant to be a level setting of what AI is from the Commission’s perspective. He commented that, as outlined in NDAA, AI is broadly scoped, and can be considered a stack of interrelated topics.

Commissioner Discussion:

Dr. Schmidt suggested adding a strong statement regarding how close China is behind the U.S. in the AI competition.

Mr. Louie agreed and emphasized the importance of the U.S. efforts, especially given that China is pursuing the AI competition with a whole-country effort.

Mr. Jassy commented that unlike the case with nuclear weapons, AI conflicts will be fought with lower barriers for entry. Many countries will be able to use AI capabilities to affect world affairs.

Dr. Horvitz noted that we are only just beginning to see the possibilities of what may happen as AI technologies are harnessed.

Hon. McFarland emphasized the subtlety of the AI competition. Rather than having tanks rolling down the street, the competition is affecting our country and our future in more diverse and often invisible ways.

Hon. Clyburn agreed, noting also how integrated AI is into everything from the most basic shopping functions to significant national security functions. She agreed that the United States needs a whole-of-government, whole-of-nation approach to this competition.

Dr. Mark highlighted the speed of innovation occurring in AI and the importance of taking that speed into consideration when creating the Commission's recommendations.

Dr. Horvitz remarked that the AI competition is not just about the need to catch up with rivals. Instead, it is also about the promise of AI and the ability to harness AI technologies in ways to provide a variety of breakthroughs.

Dr. Chien emphasized the information dialogue aspects of AI applications. He noted that the current impacts in this arena are quite evident. Therefore the challenge is to make sure we have the correct flow of information and are able to counter manipulation of facts by adversaries.

Dr. Schmidt commented that the diffusion of AI technologies are distinguishable from other arms the U.S. has encountered because it is so easy for other countries to adopt. He suggested that Commission staff consider adding this point to the introduction of the Final Report.

AGENDA ITEM: CHAPTER 1 REVIEW AND DELIBERATION

Presentation of Proposed Recommendations:

Mr. Darby presented the draft Chapter 1 of the Final Report. He noted that the Commission is focused on identifying AI-related threats, and highlighted five organizational challenges that the United States must face. These challenges include: AI-enabled information operations; targeted data harvesting; AI-enhanced cyber attacks; adversarial AI; and AI-enabled biotechnology. Mr. Darby commented that these AI-related threats illustrate a new society-level of conflict that the U.S. must organize and defend against.

Commissioner Discussion:

Dr. Schmidt asked Mr. Darby to expand on biosecurity threats.

Mr. Darby responded that as we have developed the ability to sequence genomes, we have also amassed a data set that could be edited. He noted that while there are good reasons to conduct this editing, including creating crops that grow with less water or are resistant to diseases, the technology is dual-use and thus can also have a dark side as well. He stated that norms are needed to govern the editing of biology going forward.

Dr. Horvitz commented that synthetic biology researchers have advocated for investments because we will need to respond quickly to biological threats.

Hon. McFarland noted that biotechnology has the ability to both build threats and protect from them. She remarked that this theme of dual-use technology is common in the report and that it is critical to understand both sides of the story. Hon. McFarland commented that the United States has the ability to shape this technology and how it's used. The U.S. needs to work with nations that share our values to strengthen our ability to use these technologies appropriately, while also defending against those countries who may not be using the technology appropriately.

Mr. Louie highlighted the use of AI for sensors. He noted that in both the bio and cyber arenas, the inability to sense across different networks led to vulnerabilities. AI and machine learning can significantly affect our sensemaking at machine speed.

Hon. Clyburn stated that the United States must be defensive and recognize that not everyone will embrace our values and standards. She noted that part of the challenge in upholding American standards is recognizing that we must be prepared for and aware of those who do not conduct themselves in the same way.

Dr. Matheny asked Mr. Darby for his sense on whether the U.S. has the capability to anticipate or detect these applications of AI to adjacent technologies.

Mr. Darby responded that there are incredibly capable people within the intelligence community (IC). He noted that the Commission needs to continue to shine a light on prioritizing the biotech arena as it applies to AI so that the IC feels empowered to leverage their capabilities.

Dr. Horvitz remarked that because the adversarial AI front is a very young area of research, a call for investment and mastery of this area is going to be critical.

Dr. Chien noted that in many technology domains, defending is inherently much harder than attacking because you can only fail once in defense. He remarked that the U.S. needs to retain strategic options and that deterrence is often a more practical option than a pure defense approach.

Mr. Louie noted that we can't simply say it is someone else's responsibility to deal with the brittleness of the things we create. We need to have a much more holistic view when we create these algorithms and approaches. He also noted that malware is a very small subset of cyber attacks and recommended broadening the chapter to include novel AI cyber threats and supply chain threats rather than only conventional attacks.

AGENDA ITEM: CHAPTER 2 REVIEW AND DELIBERATION

Presentation of Proposed Recommendations:

Ms. Catz presented the draft Chapter 2 of the Final Report. She noted that the DoD should have the foundational elements that enable ubiquitous application of AI in place by 2025, if not sooner, and outlined five areas in which the Secretary of Defense should direct immediate action. These areas include: building the technical backbone for the Department; training and educating warfighters; accelerating the adoption of existing digital technologies; democratizing AI development; and investing in next generation capabilities.

Hon. Clyburn also presented briefly on the recommendations to train and educate warfighters, highlighting the importance of the recommendation for Congress to pass a Goldwater-Nichols 2.0 Act that would create an emerging and disruptive technology qualification process and billets for military officers or non-commissioned officers.

Commissioner Discussion:

Dr. Moore noted that industrial organizations with AI practitioners at every level are the digital natives--companies that can prosper in this fully digital world. He stated his appreciation for this chapter's commitment to ensuring there are AI professionals throughout the governmental organizations.

Dr. Chien also highlighted the emphasis placed on both the technological and sociological components of this discussion. He credited this work and noted the importance of rotations that allow employees to be exposed to different aspects of their organization's mission.

Hon. McFarland expressed her concern regarding the United States' ability to adopt existing digital technologies. She noted that in the past, the government has tended to retain its own structure. Hon. McFarland remarked that this mentality will not allow for the necessary advancement. The United States needs to change not just its use of technologies, but also how people are structured and how we look at the ownership of responsibility.

Dr. Schmidt inquired if the line of effort considered putting in real numbers regarding quotas or size of organizations in order to force compliance? As an example he noted that there are roughly 7 combatant commands (CCMDs), and that the Commission could consider including specific goals for each CCMD in order to include something more explicit than just urging language.

Ms. Catz responded that it is difficult to make those determinations and be quite that prescriptive.

Hon. McFarland agreed and commented on the potential for malicious obedience, that is, changing as directed but not achieving the desired outcome. She noted that it is preferable to state the desired outcome that can be achieved in multiple ways, rather than be prescriptive on how specifically to achieve the goal.

Mr. Jassy agreed with Dr. Schmidt that such an illustration would be beneficial in order to give the government an understanding of the magnitude of what investments are needed.

Mr. Louie commented that DoD must also be willing to apply these technologies to disrupt organizations. He stated that the United States has a long history of applying new technologies in old ways, until an adversary comes along and uses it in a novel way. He argued that there must be a focus on spending a specific amount of budget funds on disruption, rather than waiting for adversaries to do so.

Dr. Moore noted that a one-size-fits-all solution is not appropriate. Instead expertise in each Department and Service should be celebrated and empowered with knowledge about how to use AI. They can then use their own expertise to determine how to field AI.

Ms. Catz remarked that the Commission is recommending some structural changes that may get potential pushback due to their dramatic nature. She emphasized the importance of breaking down old silos that are barriers to moving quickly.

Hon. Clyburn highlighted the running themes of structural and cultural challenges. She noted that both need to be harmonized and molded or remolded quickly to be limber enough for the type of change the United States needs.

Mr. Bajraktari read a question from Andrew Kemendo from Kessel Run: “We can only do so much from inside the DoD. We need congress to make real changes in law for hiring, salary, acquisitions and data/API mandates. How do we make progress with lawmakers?”

AGENDA ITEM: CHAPTER 3 REVIEW AND DELIBERATION

Presentation of Proposed Recommendations:

Hon. Work presented the draft Chapter 3 of the Final Report. Hon. Work noted that by 2025, DoD and our warfighters must be enabled with baseline digital literacy and access to the digital infrastructure and software required for ubiquitous AI integration in training, exercises, and operations. In short, warfighters must be “AI-Ready.” He explained that the chapter describes AI

mastery in four broad categories: prepare, sense and understand, decide, and act. To achieve mastery of AI in these areas, the Commission makes seven recommendations:

- First, DoD must drive organizational reforms through top-down leadership.
- Second, DoD will need to design warfighting concepts to inform the development of AI-enabled capabilities.
- Third, by the end of 2021, the Secretary of Defense should establish AI-readiness performance goals.
- Fourth, DoD must drive towards enduring cultural change across the Department and set the conditions to continuously out-innovate competitors.
- Fifth, DoD should define a joint warfighting network architecture by the end of 2021.
- Sixth, DoD must continue to invest in priority AI research and development (R&D) areas that could support future military capabilities.
- Seventh, the Departments of State and Defense must promote AI interoperability and the adoption of critical emerging technologies among our key allies and partners.

Commissioner Discussion:

Hon. McFarland commented on the seventh point, stating that interoperability and coalition building cannot be overemphasized to create a standard before others reach the table, particularly those who don't share American values.

Mr. Louie noted that we have learned the hard way about our inability to share information. Now the Commission is discussing sharing information at machine speeds, with machines talking to each other. It is important to not slow down our development, particularly at standards bodies, but interoperability challenges with allies must be solved.

Dr. Matheny asked about the best convening mechanisms that exist across the US and NATO for ensuring interoperability for AI.

Hon. Work responded that this is discussed in the section on developing interoperability. He explained that the initial thinking began with Five Eyes and then beginning to add partners. He suggested that the staff should look into making recommendations on existing bodies that can prove useful.

Hon. McFarland stated that it would be useful to have industry stand forward in this area as well. Given the global aspects of industry and AI, it is also important to have industry at the table when determining an agreed upon universal standard of interoperability.

Dr. Horvitz remarked the Commission's Interim Reports on AI and Ethics have included discussions about the need to coordinate with allies. Given that those topics are key interests to the European community and the Five Eyes, they should also be included in deliberations with other nations.

Dr. Moore agreed that the use of industry to help is important. He noted that there is a growing set of data models that have shown we can communicate well. He noted that there are ways that the research community and alliance can work together to provide clarity.

Mr. Bajraktari noted that NSCAI staff members will update the chapter based on Commissioner comments.

AGENDA ITEM: CHAPTER 4 REVIEW AND DELIBERATION

Presentation of Proposed Recommendations:

Hon. Work then presented the draft Chapter 4. He stated that the increasing use of AI technologies in weapon systems has generated important questions regarding whether such systems are lawful, safe, and ethical. The Commission met extensively with civil society groups, academia, and government agencies in studying this issue. Chapter 4 offers the following four judgments related to AI-enabled and autonomous weapon systems:

- 1) Provided their use is authorized by a human commander or operator, properly designed and tested AI-enabled and autonomous weapon systems have been and can continue to be used in ways which are consistent with IHL.
- 2) Existing DoD procedures are capable of ensuring that the United States will field safe and reliable AI-enabled and autonomous weapon systems and use them in a manner that is consistent with IHL.
- 3) There is little evidence that U.S. competitors have equivalent rigorous procedures to ensure their AI-enabled and autonomous weapon systems will be responsibly designed and lawfully used.
- 4) The Commission does not support a global prohibition of AI-enabled and autonomous weapon systems.

Hon. Work noted that these judgments do not obviate countries' obligation to take steps to reduce risks associated with AI-enabled weapon systems. Such efforts should and must be led by the United States. The Commission makes several recommendations to mitigate such risks. These recommendations can be split into three groups: actions the United States can take by itself, with its allies, and with its strategic competitors.

- Acting by itself, the United States should clearly and publicly affirm existing U.S. policy that only human beings can authorize employment of nuclear weapons, and seek similar commitments from Russia and China. Additionally, the United States should pursue

research on technical means to verify both compliance with AI-related arms control agreements, and to prevent proliferation of AI-enabled and autonomous weapon systems.

- Acting with allies, the United States should develop international standards of practice for the development, testing, and use of AI-enabled and autonomous weapon systems.
- Finally, acting with competitors, the United States should discuss AI's impact on crisis stability within the existing U.S.-Russia Strategic Security Dialogue, and should create an equivalent dialogue with China.

Commissioner Discussion:

Hon. Work read a question from Michael Klare, from Arms Control Association: What measures do you recommend to prevent the unintended or accidental outbreak of nuclear war arising from increased reliance on AI-enabled computer-assisted battlefield decision-making?

Hon. Work responded that the U.S. should clearly and publicly affirm that only human beings can authorize use of nuclear weapons and it should seek similar commitments from all nuclear-armed states, including Russia and China. He also stated that the Commission believes the United States should establish a channel with Russia and China to discuss the impact of AI-enabled systems on crisis stability. Hon. Work noted that the United States should be very careful with use of autonomous systems and any combat system that might be able to order a retaliatory strike. He also stated that we must also discuss the impact of such systems within the existing U.S.-Russia Strategic Security Dialogue (SSD), and create a U.S.-China Strategic Security Dialogue. Finally Hon. Work noted that there should be international standards of practices for the development, testing, and use of AI in weapons systems to ensure all states field responsible AI autonomous weapons systems.

Dr. Horvitz remarked on the importance of these issues and expressed his hope that interested individuals will dive into the content of the chapter. He noted that there is great concern about the risk of unintended escalation and crisis management that may occur for many reasons. He highlighted the need for a U.S-China SSD similar to the SSD the U.S. has with Russia.

Mr. Louie commented that it is important to invest in new ways to think about testing, validation, and evaluation. Testing individual systems isn't good enough when systems are interacting with each other. As autonomous systems become more networkable, those models must also be tested.

Dr. Schmidt added that he uses the term "emergent behavior." Autonomous systems have some amount of error in them. When combined, it can result in unexpected emergent behaviors. Thus sufficient testing is critical. In addition, he noted that with the emergence of new capabilities and use cases, it is also important to pursue technical means to verify and ensure compliance.

Hon. McFarland commented on the challenge involved with the ability to be transparent. She expressed particular concern around nations that do not join an agreement to create transparency.

Mr. Louie answered a question regarding land mines and autonomous systems from Peter McKinnon: Landmines are a type of autonomous system. Much of the world has come to ban such weapons. Does this set a precedent for the debate about autonomous weapons?

Mr. Louie responded that it is hard to reduce the risk of AI-enabled indiscriminate weapons. However, it may be possible to reduce casualties by adding precision in targeting. Mr. Louie noted that it is the Commission's hope that AI and ML will reduce horrors of warfare.

Hon. Work reinforced what Mr. Louie said, noting that landmines were banned because they were indiscriminate and had an unlimited mission duration. He also noted that the biggest contributor to inadvertent engagements is target misidentification. Building off of Mr. Louie's comments, Mr. Work noted there is reason to believe that AI will improve target identification, which in theory would reduce civilian casualties, collateral damage, and fratricide in war. Hon. Work stated that it is a moral imperative to pursue this hypothesis. He further noted that autonomous systems are not inherently indiscriminate. Given the United States and the UN have said indiscriminate weapons are not consistent with International Humanitarian Law. Hon. Work stated that we have to test these systems and understand their limitations. He also commented that we can only use them in situations where AI is not so brittle that it is most likely to malfunction. Ultimately, Hon. Work remarked that there is a lot of reason to believe that AI will improve and decrease inadvertent engagements.

Dr. Horvitz noted that some day the standards of expectations of IHL will change, given the rise of more precise systems.

Mr. Bajraktari read a set of questions/comments:

- Comment from Jonathan Rodriguez: This section is excellent and extremely important. This will help save millions of lives.
- Question from Geoff Odlum: Regarding the recommendation to fund technical means to verify compliance with future AI arms control agreements: How? What technical verification measures do you envision?

Dr. Moore responded to Mr. Odlum's question, noting that we are seeing a trend of practice of AI where there is a move away from black box neural networks into proper, scientifically understood model-based statistical models to make decisions. One of the things the Commission is hoping comes out of this chapter and the chapter on ethics is a move towards a system that is understandable, rather than a black box making decisions that cannot be explained.

Mr. Louie emphasized Dr. Moore's point that the United States cannot build systems as black boxes. They need governance. He noted that we would never give humans the ability to make decisions without property authority. Similarly, that authority would not be given to machines. Mr. Louie commented that the United States must be very thoughtful and should hold all nations to that same standard. He noted that it is in everybody's interest not to design systems that go rogue.

Dr. Horvitz further emphasized the notion that, for any automated action, there must always be an accountable human for what that system does. He noted that these are human-accountable decisions and we must be accountable for the behavior and the uncertainty associated with these systems.

AGENDA ITEM: CHAPTER 5 REVIEW AND DELIBERATION

Presentation of Proposed Recommendations:

Dr. Matheny presented the draft Chapter 5 of the Final Report. He noted that the first section of the chapter sets up an Ambitious Agenda for the intelligence community to be AI-Ready by 2025. AI-Ready by 2025 means that intelligence professionals are enabled with baseline digital literacy and access to the digital infrastructure and software required for ubiquitous AI integration in each stage of the intelligence cycle. To achieve this, the Commission makes six concrete recommendations:

- Change risk management practices to accelerate new technology adoption.
- Empower the IC's science and technology leadership
- Improve coordination and interoperability between the IC and DoD.
- Capitalize on AI-enabled analysis of open source and publicly available information.
- Prioritize and accelerate collection of scientific and technical intelligence to better understand adversary capabilities and intentions
- Aggressively pursue security clearance reform for clearances at the Top Secret level and above, and enforce security clearance reciprocity among members of the IC.

Dr. Matheny also noted that the second section of this chapter established the goal of AI-Enabled Intelligence by 2030. To achieve this, the Commission recommends the following three steps:

- Advance and continue to build out a purpose-built IC Information Technology Environment that can fuse intelligence from different domains and sources.
- Embrace fused, predictive analysis as the new standard.
- Develop innovative human-centric approaches to human-machine teaming.

Commissioner Discussion:

Dr. Schmidt asked if 2030 was too late a timeframe.

Dr. Matheny agreed that it was and stated that although they would have wanted to create a 2025 goal for all of the recommendations, there was anxiety around this idea due to a lack of demonstrable progress in the last four years that would make this seem attainable. Dr. Matheny commented that this could be a bad attitude to adopt and that they should be aspiring to get it done faster.

Dr. Schmidt stated that the Commission should take a strong position about moving as fast as possible. He stated that this could be an easy win for national security if done correctly.

Dr. Matheny agreed that the Commission should take the 2030 recommendation bucket and move the timeline to 2025.

Hon. McFarland agreed with the change in timing. However, she noted that there is a problem with skills and adoption. The Commission also needs language in the implementation plan on how to bring talent to the IC that is qualified and can achieve the necessary goals. She stated that the Commission must be both aspirational and pragmatic.

Mr. Louie noted that there is an amazing cadre of IC officers that can move mountains. He argues that the Commission needs to tell them that they need to do it again. He stated that the workforce is looking for that signal; they are not looking for the easy way out. We need advanced systems and 2025 is a reasonable timeframe to get it done.

Mr. Jassy agreed that the United States can move faster and that a more aggressive goal should be set. However, he also emphasized the progress the IC has made in adopting the cloud and everyday AI. Mr. Jassy also noted that different parts of the federal government can combine resources in order to avoid duplication of functionality and improve efficiency.

Dr. Chien also agreed that there is a desire to move quickly, but he also noted that cultural change and changes in ways of thinking will be crucial. It is not just a matter of swapping out tools.

Dr. Horvitz agreed that individuals with a detailed understanding of the status quo are going to be necessary to take the IC from where it is today to where it can be better.

Mr. Louie emphasized Dr. Chien's point about needing a cultural change in the IC, integrating those who understand how to work with technology. He noted that this must also include integration into senior leadership.

Hon. McFarland agreed that the problem exists in adoption and adaption. The Commission must consider how to help the cultural and organizational changes necessary.

Dr. Chien outlined two important tools: constant rotation and cross-fertilization from people who understand the mission and those that understand the technology; and constant experimentation. Dr. Chien stated that the United States should uniformly lower barriers for both of these processes and make sure they become commonplace not the exception.

Mr. Bajraktari read a series of questions from the public:

- Question from Cindy M via YouTube: Are you concerned that analysts will become biased or overly dependent on AI-enabled intelligence (particularly around the forecasting function that was mentioned.)
- Question from Peter MacKinnon via YouTube: "Has the potential of quantum-based cyber threats being considered in this or other chapters? Further, what are the implications of quantum breakthroughs in the next 10 years wrt to this initiative? [Mr. Bajraktari suggested commissioners turn to this question during Day 2, discussion of draft Chapter 16.]
- Question from Dean Souleles via YouTube: Do we need to go further in recommending structural changes to the IC to empower the DNI with authorities commensurate with responsibilities across the IC?

Dr. Matheny answered the first question, stating that there is research literature on automation bias (bias in trusting automated decision-making tools). He also noted that there are interesting counter examples where people have insufficient trust in decision-making tools, including in the intelligence community. Thus is one of the reasons why the IC has been interested in models that are more transparent and interpretable than traditional ML models. Dr. Matheny stated that we need to make sure analysts are not placing excessive trust in models.

Regarding Mr. Souleles's question: Dr. Matheny noted that the elevation of a CTO within the DNI office that is responsible for coordinating modernization of technology across the IC is needed. Dr. Matheny stated that a coherent budget request that reflects the IC's collective needs to Congress is necessary to enable that. Getting agencies to act in unison is challenging. Thus as a first step, this new position should be created with appropriate authorities within DNI.

Mr. Louie stated that he would love to have a member of DO or DI who understands technology. Minimally, this should be developed among the next generation of IC leaders.

Hon. Work responded that we want to attempt to tie IC conversation with earlier discussion on OODA loop. He noted that the whole goal of the OODA loop is to make the adversaries' perceived reality diverge from actual reality, and commented that it is becoming more and more difficult to understand what actual reality is. This is where AI tools can actually help. They will not be right all the time, but they will be right more often than humans trying to understand an avalanche of data. Hon. Work commented that time is of the essence and that the United States needs a cultural shift.

Mr. Bajraktari noted that due to a change in the agenda, the Commission would skip Chapter 6 and move on to Chapter 7. Chapter 6 was moved to the agenda for the following day.

AGENDA ITEM: CHAPTER 7 REVIEW AND DELIBERATION

Presentation of Proposed Recommendations:

Dr. Horvitz presented the draft Chapter 7 of the Report. Dr. Horvitz noted that in July, the Commission produced a detailed framework to guide the responsible development and fielding of AI across the national security community. It contains key considerations for policymakers and technical practitioners covering the breadth of the AI lifecycle and practices that should be integrated and updated as the technology advances. Since publishing this framework, the Commission has received feedback on the *Key Considerations* from the public, from domestic and international members of the AI community, and from stakeholders within departments and agencies critical to national security. This included policymakers and AI practitioners from the Department of Defense, Intelligence Community, Federal Bureau of Investigation, Department of Homeland Security, Department of Energy, Department of State, Department of Health and Human Services, and the AI Community of Practice.

Dr. Horvitz then noted that, in the final report, the Commission highlights key actions from the *Key Considerations* framework that all departments and agencies critical to national security can and should take now as a priority. He also discussed recommended investments and resources that the government should make available to further responsible AI across all agencies. These recommendations span five categories: (1) Robust and Reliable AI; (2) Human-AI Interaction and Teaming; (3) Testing and Evaluation, Verification and Validation; (4) Leadership; (5) Accountability and Governance.

Commissioner Discussion:

Dr. Matheny noted that he is deeply impressed by the leadership and staff's work in this area. He stated that this section contains some of the most ambitious and useful recommendations that he has seen in this category in any report.

Dr. Schmidt joined Dr. Matheny's praise. He also inquired into the relationship between the Defense Innovation Board and NSCAI's work.

Dr. Horvitz stated that the Line of Effort followed the DIB's work very closely and that they view the DIB's AI ethics principles as a high level, aspirational document. He stated that the Key Considerations get into the next level of detail. Dr. Horvitz also highlighted a matrix published in the Interim Report that shows the relationship between the NSCAI recommendations and the DoD's high level principles.

Hon. McFarland emphasized the importance of understanding the process of due diligence that must be applied here. She noted that there are meaningful implementation steps that must be applied to ensure we are aligned with our values and norms. Systems must be validated for our nations to accept them.

Dr. Horvitz reiterated that the DoD and DIB's work is stunning and heartening to see. He noted that those principles were incorporated into the work of NSCAI's Line of Effort.

Mr. Bajraktari read a question from Andy Lacher: What role can run-time assurance capabilities play in ensuring that AI/autonomous systems operate within acceptable bounds?

Dr. Horvitz responded that there is a strong body of work within and outside of AI on runtime verification. One of the ideas is that, given the complexity of AI systems, it is possible to have a simpler system with simpler rules overseeing more complicated systems in order to provide bounds and guardrails. Dr. Horvitz noted that this is a great idea and a direction of research.

AGENDA ITEM: CHAPTER 8 REVIEW AND DELIBERATION

Presentation of Proposed Recommendations:

Dr. Horvitz presented the draft Chapter 8 of the Report. He noted that the promise of emerging AI technologies to enhance national security is significant. U.S. intelligence, homeland security, and law enforcement agencies must be able to develop and use AI technologies for national security purposes. But to do so, the government must ensure their use is effective, legitimate, and lawful. Public trust will hinge on justified assurance of compliance with privacy, civil liberties, and civil rights. Dr. Horvitz outlined Chapter 8's recommendations that the government should:

- Invest in and adopt AI tools to enhance oversight and auditing in support of privacy and civil liberties.
- Improve public transparency about how the government uses AI.
- Develop and test systems with the goal of advancing privacy preservation and fairness.
- Strengthen the ability of those impacted by government actions involving AI to seek redress and have due process.
- Strengthen oversight mechanisms to address current and evolving concerns.

Commissioner Discussion:

Hon. McFarland highlighted the need to avoid creating a bureaucratic system that slows down the use and application of AI. She stated that changes must be made effectively and appropriately, while also at the speed needed for AI.

Mr. Louie noted that a heterogeneous approach could solve certain parts of problems, including having algorithms check for bias or check for violations of privacy. AI can be applied in different ways and should be applied using a multi-prong strategy. The challenge with machines is they do things at machine speed and at scale, including exhibiting bias. Appropriate systems are needed to check these risks.

Dr. Moore questioned the focus on AI specifically as the area where we need to be responsible. He reasoned that there are plenty of cases where mixing technologies that aren't considered AI were very arguably unethical and he cautioned against creating a situation where individuals begin manipulating the definition of AI in order to avoid scrutiny. He inquired if the Commission is creating that danger by emphasizing responsible AI and not responsible technology generally?

Dr. Horvitz suggested broadening the scope to "data centric." He noted that, when it comes to privacy, he does not discriminate between AI technologies and something a statistician might say is statistics or a regression. He stated that the Commission should point out that it refers to AI broadly when it comes to automation and a set of technologies that comes to automation.

Hon. McFarland noted that while working in the government, she experienced difficulties when looking at application and rule-setting. She suggested discussing the internal mechanisms that already exist within organizations that can be leveraged. She remarked that humans will be critical and unfortunately, as a society, humans are already biased. There will be a challenge in demonstrably validating implementation in the appropriate manner.

Mr Bajraktari read three questions aloud to the Commissioners:

- Question from Kolja Verhage via YouTube: Are there any thoughts on how government can offset the impact or costs on the algorithm supply chain by the potential imposition of ethical and non-biased performance requirements for AI algorithms?

- Question from Cindy M via YouTube: How would you recommend empowering Responsible AI leads, so that individuals have the authority needed to ensure AI systems aren't fielded unless they meet an agency's safety and ethical thresholds?
- Question from Jack Poulson via YouTube: Does the NSCAI assess that the DoD's usage of Clearview AI, X-Mode, and Everalbum (dba Paravision) violated the AI Principles commitment to auditable data?

Dr. Horvitz remarked that these are all rich questions. On the first, he stated that when it comes to essential requirements, there is no getting around them. The country cannot afford to build systems that are inconsistent with our values and civil liberties. If it costs more, that is who we are. The United States must address issues with as much efficiency as we can garner. Dr. Horvitz stated that if there is some sluggishness because of what society requires of its systems, so be it.

Dr. Horvitz also stated that, when it comes to empowering responsible AI leads, the Commission is identifying a need for not just education and empowerment, but also cultural changes and scorecards that are empowered by being transparent to the agencies and the public.

Finally, Dr. Horvitz noted his interest in the last question. He highlighted the need to look very carefully at the *Carpenter v. U.S.* decision and the idea that the government needs a warrant for looking at data, specifically GPS data in the case discussed by the Supreme Court, especially when it comes to the individual's expectation of privacy - when it comes to something as sensitive as location. Dr. Horvitz also noted that it is important for Congress and the Judiciary to look at the adequacy of current legal constraints, including data acquired by data brokers and third parties. In the current state, it is not clear if and how the courts will apply *Carpenter* when the government (in the national security context) uses private commercial data in national security that reveals, for example, the location of U.S. persons. Dr. Horvitz noted that this is a big discussion area, with many members of civil society concerned about the third party doctrine justifying the warrantless receipt of data. He also noted his expectation that this issue will ultimately go to the Supreme Court.

Dr. Moore emphasized his agreement. Although change will slow things down, it is essential. Being responsible changes the nature of AI. It has many advantages, but it does require work. Dr. Moore also added that some decisions about how to use data should not be made by AI professionals. Elected officials, the justice system, and sometimes even international bodies should be making these societal decisions. Then technologists can make sure they are implemented.

Mr. Louie stated that there is a growing body of law that needs to grow a lot more domestically and internationally as it relates to data. Europeans, Americans, and Asians have different points of view and leaving it solely up to America to monitor itself is not ideal. He argued that this is a

body of work that needs to be worked on, but also argued against waiting on a court case to deal with it.

Dr. Horvitz agreed that it will be an important discussion point when working with NATO partners who are very sensitive on the privacy and civil liberties front as well.

At the conclusion of the discussion, Mr. Bajraktari remarked that, with the exception of Chapter 6 which had been postponed, the Commission had concluded deliberation on the first half of the Commission's Final Report which focuses on defending against AI threats. Now the Commission would move on to the second half, which focuses on winning the AI technology competition and situates AI in a broader national security context.

AGENDA ITEM: CHAPTER 9 REVIEW AND DELIBERATION

Presentation of Proposed Recommendations:

Mr. Darby presented the draft Chapter 9 of the Final Report. In Chapter 9, the Commission recommends that the government should: create a Technology Competitiveness Council or TCC, which would be chaired by the Vice President with a newly appointed Assistant to the President for Technology Competitiveness serving as the day-to-day leader; develop a National Technology Strategy; and establish a high-level U.S.-China Comprehensive Science & Technology Dialogue. The dialogue should focus on challenges presented by emerging technologies—to include AI, biotechnology, and other technologies as agreed by both sides.

Commissioner Discussion:

Dr. Schmidt commented that he is very interested in the discussion on national competitiveness and looks forward to the discussion that will occur on the following day.

Mr. Louie remarked that it is important to find common ground with competitors to do some good for both countries as well as for the world. He noted that the conversation should be about more than just competition, because there are things we can work on together to move society forward. The more common ground we can find, the less tension we can have in the world.

Dr. Moore asked Mr. Darby for clarification that the report is not recommending disrupting international collaboration on research to improve the human good.

Mr. Darby agreed with Dr. Moore, saying that this is the exact opposite of the point the report is trying to make. He stated that the United States needs to reach out, establish a dialogue, and work with others on areas that make sense. He noted that this type of collaboration can be used to address global issues and can provide the foundation level of discussion that could be leveraged for more difficult conversations down the road.

Mr. Bajraktari read two questions from the public:

- Question from Peter MacKinnon via YouTube: How do these entities compare and interface with the newly approved National AI Initiative Office approved by Congress Dec 3rd?
- Question from Peter Brown via YouTube: Will the proposed TCC have only an executive role or also involve Congress, particularly when considering possible international aspects of this important work?

Dr. Matheny stated that TCC will have a closed relationship with Congress. He also noted that there is an encouraging sign in having a new CSET bureau at State that will be involved in tech diplomacy.

Mr. Bajraktari read aloud some questions from Sarah Cammarata: Do you expect the Biden administration to take a hardline policy against China and make AI a priority in the White House? What is the first thing that the administration can do to implement some of your recommendations to counter China and act with the urgency you are arguing for? Also, if there were one or two things you would want DoD to take away from this report, what would that be?

Dr. Schmidt expressed that the China question will be a part of the broader China strategy that he knows the Biden administration is working on. On the DoD question, Dr. Schmidt emphasized that the Commission has always highlighted challenges surrounding attracting and retaining talent as a key priority.

Mr. Louie agreed with Dr. Schmidt on a broader strategy. He noted that the discussion is not necessarily about a hard line on China, but rather a hard line on any inappropriate uses of technology by any state, including China. On immigration, Mr. Louie noted that the U.S. has an immense capability to take talent from anywhere in the world and make it uniquely American. He stated that the United States needs to protect our technology and IP to be sure that it isn't misused. Likewise, the nation needs a national technology competition strategy, especially as China has announced multiple similar strategies. Mr. Louie stated that there will be a fourth industrial revolution and AI will lead the way. Lastly, he emphasized the importance of working with partners and allies.

Dr. Horvitz emphasized that these issues would be discussed more the following day, including the U.S.'s ability to attract talent.

AGENDA ITEM: CLOSING REMARKS

Dr. Schmidt gave closing remarks.

ADJOURNMENT:

The meeting was adjourned at 3:00PM EST by Ms. Ponmakha, the Designated Federal Officer.

Day 2: Tuesday, January 26, 2021 – 12:00pm – 3:00pm EST

Location: Video Teleconference

ATTENDANCE

Commissioners Present:

- Dr. Eric Schmidt, Chairman
- Hon. Robert Work, Vice-Chair
- Ms. Safra Catz
- Dr. Steve Chien
- Hon. Mignon Clyburn
- Mr. Chris Darby
- Dr. Ken Ford
- Dr. José-Marie Griffiths
- Dr. Eric Horvitz
- Mr. Andy Jassy
- Mr. Gilman Louie
- Dr. William Mark
- Dr. Jason Matheny
- Hon. Katharina McFarland
- Dr. Andrew Moore

Staff Present:

- Yll Bajraktari, Executive Director
- Michael Gable, Chief of Staff, Committee Management Officer
- Angela Ponmakha, Designated Federal Officer
- Michael Lueptow, General Counsel
- Tara Rigler, Director, Strategy, Communications, and Engagement
- Commission Staff

AGENDA ITEM: CALL TO ORDER AND OPENING REMARKS

Ms. Ponmakha, as the Designated Federal Officer, called the meeting to order. In her remarks, she informed the audience that due to an agenda change, the Commissioners' discussion of Chapter 6 was postponed the previous day. Chapter 6 would be the first item on the agenda for this meeting.

Mr. Bajraktari, Dr. Schmidt, and Hon. Work, gave brief opening remarks.

AGENDA ITEM: CHAPTER 6 REVIEW AND DELIBERATION

Presentation of Proposed Recommendations:

Dr. Griffiths presented the draft Chapter 6 of the Final Report. Dr. Griffiths stated that Chapter 6 is structured around the argument that to expand and improve its digital and AI workforce, the government needs to Organize digital talent within government through a talent management system designed to house highly skilled specialists; where talent is located in an organization is as important as the quality of the talent; Recruit digital talent that already has the skills the government needs, such as industry experts, academics, and recent college graduates; Build its own workforce by training and educating current government employees; and Employ its digital workforce more effectively to ensure digital talent can perform meaningful work once they are in government.

Each of these topics has associated recommendations. Dr. Griffiths highlighted four:

- Under organize, government agencies should establish digital corps that recruit, train, educate, and manage their digital workforce.
- Under recruit, the government should create well-organized opportunities for civilian digital experts to serve part-time in government by establishing a National Reserve Digital Corps.
- Under build, the United States needs to establish the United States Digital Academy, a new government civilian service academy to train future civil servants.
- Under employ, the government needs to establish a suite of digital career fields for both civilian and military personnel, including software development, data science, and artificial intelligence.

Commissioner Discussion:

Dr. Mark underscored a tie-in to the Commissioners' discussion the previous day. Educating an AI-ready workforce is not just about building skills, it is also about building accountability.

Hon. McFarland emphasized the need for a changing workforce as well as the need to reskill and tap into the broader workforce that does not have access to universities.

Dr. Schmidt asked for further clarification of the conception of the U.S. Digital Service Academy, inquiring if it would be accomplished by existing universities in the private sector.

Dr. Griffiths responded that it is an important part of the future to bring people together to develop a common set of ideas and believe they will have a career in government. She stated that there will be implementation challenges because it is such a bold step. However, she believes that it will require the combination of creating an entity as a standalone entity, but also potentially in collaboration with other institutions.

Hon. Clyburn remarked, that existing pathways, though notable, have fallen short of meeting the mark. She stated that the country needs a bold and intentional approach to create a new construct for those who may not be able to afford traditional pathways. The talent exists within the United States, it is just not cultivated.

Dr. Chien highlighted his belief that these recommendations are not to supplant the traditional education pathway.

Hon. Clyburn agreed, but reiterated that the Commission must recognize where the deficiencies exist. She pointed out that where she is in South Carolina, some of the traditional pathways are not capturing potential talent because of affordability concerns and other constraints.

Mr. Louie offered a comparison to models that have been previously applied, specifically the National Intelligence University, a degree-giving institution for members of the IC and Armed Services. He commended its ability to attract talent as well as develop existing talent.

Dr. Moore noted that, as a former computer science educator, he strongly resonates with the points made by Hon. Clyburn and Dr. Griffiths. He stated that it is time to rethink pieces of education, and noted that there are many experienced computer scientists that would relish the opportunity to rebuild traditional educational establishments without the overpriced aspects of traditional university education.

Hon. McFarland voiced her belief that industry should play a role in this construct. She suggested that the Commission think more about how industry partnership can contribute to these goals.

Dr. Horvitz suggested a working group with experts from industry, government, academia, and others to consider what each group can contribute to these concepts.

Hon. Work brought the conversation back to Dr. Schmidt's question, and responded that the USDSA was conceived as a pathway for those who know they want to become a civil servant and have a government career. Then, the Commission is also recommending the creation of the NRDC based on the ROTC model, which would attract individuals who want to serve their country but don't want a full-time career in government.

Dr. Schmidt suggested that the proposals should be as specific as possible in order to prevent the recommendation changing in unwanted ways as it is implemented.

Mr. Bajraktari asked an NSCAI staff member from Line of Effort 3 to provide more background.

An NSCAI staff member outlined that the Commission tried to explore 3 broad categories of methods to bring talent into the U.S. Government: improving the hiring process; expanding existing scholarship for service programs; and creating a government-specific institution that can help shape the Government's culture around technology. He noted that the recommendations are a combination of building off of existing government institutions and creating new ones as well.

Mr. Bajraktari noted that the Commission staff has had numerous engagements with the Hill and that they are interested in building the talent pool. He stated that this will continue and that Commission staff will keep Commissioners posted on these conversations going forward.

AGENDA ITEM: CHAPTER 10 REVIEW AND DELIBERATION

Presentation of Proposed Recommendations:

Dr. Griffiths presented the draft Chapter 10. Chapter 10 includes two sets of recommendations that address both domestic and international talent. First, the Commission asks Congress to pass a new National Defense Education Act to bolster STEM education in America. The NDEA II would focus on funding students acquiring digital skills, like mathematics, computer science, information science, data science, and statistics. It should also fund scholarships for undergraduates, fellowships for graduate students, and postdoctoral positions.

Dr. Griffiths also outlined the second set of recommendations, focused around immigration. She stated that in order to ensure the United States continues to serve as a beacon for the world's talent, the government needs to move quickly to enact a combination of Executive and Legislative Branch actions. The Legislative Branch actions should revolve around the passage of a National Security Immigration Act that would help attract and retain highly-skilled workers, immigrants, and entrepreneurs. Such an act would:

- Grant green cards to students graduating with STEM PhDs from accredited American

- universities,
- Double the number of employment based green cards,
 - Create an entrepreneur visa, and
 - Create an emerging and disruptive technology visa.

Commissioner Discussion:

Dr. Chien noted that the recommendations have a dual-track structure, with both a homegrown track and an immigration track. He also suggested that the Commission consider whether they should more strongly emphasize fellowships for AI not STEM, given the Commission's focus on AI. Although Sr. Chien did note that STEM is important to AI.

Dr. Ford agreed with Dr. Chien's comment.

Dr. Griffiths noted that the recommendations do include some specifics, but noted that it may be beneficial to add in specific numbers for fellowships, post-docs, etc.

Dr. Chien commented that the NDEA II proposal has that kind of support. He said it may be beneficial to bring that to the forefront of the report.

Hon. McFarland commented that the AI challenge exists from high school through graduate school; it is not confined to the undergraduate field. She noted that to get more workers in this field, the Commission needs to highlight a broader set of actors. She also commented that all of the report chapters are interrelated and that it is important to read the full report and understand how the issues are connected.

Dr. Griffiths agreed and noted that from early on in the Commission's work, they noted the common element of workforce development. Thus the Commission has tried to bring everything together in its recommendations. Regarding Hon. McFarland's comment about the issue extending beyond undergraduate and graduate work, Dr. Griffiths highlighted some of the Commission's prior recommendations that have addressed this issue.

Dr. Griffiths commented that this chapter is largely self-explanatory and that the Commission is trying to recommend bold ideas. She stated that the Line of Effort will take the Commissioners' comments under advisement.

AGENDA ITEM: CHAPTER 11 REVIEW AND DELIBERATION

Presentation of Proposed Recommendations:

Dr. Moore presented the draft Chapter 11 of the Final Report. He noted that Chapter 11 presents a comprehensive national plan to sustain U.S. leadership in AI and put our nation on the path to harness AI as the engine of invention we know it to be. In this section the Commission recommends action along three key lines of effort:

- First, scale and coordinate federal AI R&D funding. This should be accomplished by:
 - Establishing a National Technology Foundation to complement the National Science Foundation and focus on emerging technology.
 - Increasing federal funding for AI R&D at compounding levels, doubling annually to reach \$32 billion per year.
 - Prioritizing AI R&D investments in areas critical to advance technology that will underpin future national security and economic stability.
 - Tripling the number of National AI Research Institutes.
 - Launching grant awards that make big bets on the people and the out of the box ideas that could transform the field.

- Second, expand access through a National AI Research Infrastructure. This should include:
 - A National AI Research Resource to bridge the compute divide through access to cloud-based compute resources, co-located with AI-ready government and non-government data sets, educational tools, and user support.
 - A set of domain-specific AI R&D test beds sponsored by various federal agencies.
 - Pipelines for the curation, hosting, and maintenance of complex data sets for training.
 - An open knowledge network.

- Third, leverage both sides of the public-private partnership. To do so, the government should:
 - Create markets for AI and other strategic technologies as a consumer of technology, which would steer the field toward areas of national and national security interest.
 - Form a network of regional innovation clusters to foster the growth of small companies in sectors such as AI that are critical to overall U.S. competitiveness.

Commissioner Discussion:

Dr. Schmidt remarked that there is not a lot of discussion about AGI-- artificial general intelligence--in our report. He asked if there is a mention of AGI in this chapter or in another part of the report.

Dr. Horvitz noted that the Commission points out that this is one of the key directions of AI research. He agreed that there is a narrowing field of teams that have the resources to compete in

that space. He stated that there will need to be a multi pronged approach. Dr. Horvitz also noted that in part, this is addressed by the Commission's recommendation for the National AI Research Resource. He stated that the Commission calls for private investment and nonprofit support, in addition to other recommendations, to level the playing field to tackle some of those hard challenges.

Dr. Moore drew a comparison to the field of astronomy where thousands of researchers are using dozens of instruments. There is not an expectation that everyone will be able to build their own instruments, but some people are able to build large projects.

Dr. Chien pointed out that those major assets are currently being scheduled by AI systems like Hubble and the James Webb Space Telescope in the future. He also emphasized the multi-agent aspect of systems. He noted that for the foreseeable future, machines will be interacting with humans and that determining the right composition for those teams will be one of the essential challenges of effective use of AI.

Dr. Horvitz commented on the topic of human-AI teaming. He noted that when the founders of AI called out what the big challenges were, i.e. perception, learning, reasoning, and natural learning, they didn't call out cooperative intelligence, teaming, multiple agents working together. Dr. Horvitz stated if you think about the flourishing of human society, what makes us different is our incredible intelligence when it comes from cooperative activity.

Dr. Schmidt expressed his concern that there is a very small number of the kinds of facilities where people can do AI research. He is concerned that a national network won't be big enough. Dr. Schmidt also stated that the massive training data needed is often proprietary. He said his ideal scenario would be the existence of a very large set of public training data and public facilities and data centers for everyone to use.

Dr. Moore noted that it wasn't the Commissioners' intent and that they would clarify. He stated that the intent is that there should be a national resource for smaller companies and universities to operate at the same level as giant corporations. He also commented that Dr. Schmidt might be overestimating the issue with data. He stated that it is unknown whether deep neural networks are pathways to general intelligence, and that it is just as likely to come out of an AI professor in Arkansas who sees something differently.

Dr. Schmidt also expressed concerns about the concentration of resources, noting that one of the great things about computers is that the ability to innovate is diffused.

Mr. Louie suggested that the answer might be found in biology, just as much as mathematics. He emphasized the lack of sharing of compute and stated that we need a strategy to keep that research from being as disparate as it currently is.

Dr. Horvitz stated that he believes that the path to more general AI will be a combination of massive large scale deep neural networks and smaller ideas. He also stated that many bright academics are going to be locked out of some of the biggest compute resources available and that should frame the way the Commission describes what it means about the national AI infrastructure resource.

Hon. McFarland commented that the nation needs democratization of access to an area that is currently very regional. She quoted a statistic in the Final report that more than 90% of US innovation occurred in five coastal cities. She stated that a cultural change is needed in our ability as a society to coordinate and collaborate. The Final Report does say that, but it should be more clear.

Mr. Bajraktari read two comments aloud from Paul Nelson: “National security threats also might be posed by excessive concentrations of market power within the AI industry or industries that deploy AI-enabled services” and “A concern on R&D---a key gap is a comparative lack of resources for objective, clear-eyed research on societal impacts. R&D can't just be about ‘tech,’ but also societal & governance questions.”

Dr. Moore noted that the Commission agrees with this concern. He stated that in Chapter 11, and in other chapters, the Commission is clear that national test beds and national pushes are needed to practice what we preach and use AI to build useful products for good.

Mr. Bajraktari noted that the Commission staff will tweak Chapter 11 in line with the Commissioner comments included in this conversation.

AGENDA ITEM: CHAPTER 12 REVIEW AND DELIBERATION

Presentation of Proposed Recommendations:

Mr. Louie presented the draft Chapter 12 which focuses on the importance of Intellectual Property policies and regimes to national priorities, such as national security, economic interests, and technology competitiveness. Mr. Louie stated that Chapter 12’s overarching recommendation is that America’s IP laws and institutions must be considered as critical components for safeguarding U.S. national security interests, including advancing economic prosperity and technology competitiveness. To this end, the President should issue an executive order to recognize IP as a national priority and require the development of a comprehensive plan to reform and create IP policies and regimes that further national security, economic, and

technology competitiveness strategies. Further, the Commission recommends that the Secretary of Commerce—in coordination with the Director of the United States Patent & Trademark Office—develop proposals to reform and establish new IP policies and regimes, as needed, to incentivize, expand, and protect AI and emerging technologies. The Technology Competitiveness Council or Vice President should determine which proposals made by the Secretary of Commerce should be elevated and integrated into national security, economic interests, and technology competitiveness strategies.

Commissioner Discussion:

Mr. Louie noted that the concentration of IP is shifting to a broader global competition. China is aggressively moving out on the IP front as a way to project its capabilities and its power. The United States needs to think about how to apply IP to topics like software using a more global strategic viewpoint instead of the traditional inventors' viewpoint.

Dr. Chien remarked on the challenges involved as the world evolves, noting that during the Cold War, there was less crossover between defense and commercial technologies, and the economies of competing countries were not so closely intertwined. The current state of the world presents a unique challenge in responding to IP-related problems in a national security context.

An NSCAI staff member emphasized the importance of elevating IP policies to a national priority. She stated that the current policies are antiquated and that more attention is needed on this issue.

Mr. Louie also pointed out that many of the legal challenges are being litigated in international courts, rather than in the U.S. court systems. As such, the United States' needs to consider a more holistic viewpoint.

Dr. Horvitz asked if there is a sense that U.S. patent policies have moved away from protecting software innovations, noting the difference in protection of code as opposed to hardware.

An NSCAI staff member noted that there have been many cases since 2010 addressing the types of inventions that can be protected. However, patent eligibility is still listed in Chapter 12 as an area needing further attention.

Mr. Louie agreed that the issues need to be considered and that software has been a challenge in the patent office as it is sometimes difficult to determine if it is the codes that need to be protected, or what the code does.

Dr. Horvitz stated that innovation has been pushed into non-disclosures and trade secrets, which is arguably not good for innovation.

Mr. Louie noted that the Commission is not taking a position on what the results should be, but elevating the need to evaluate IP regimes to a national level.

Hon. McFarland commented that as an engineer, she has struggled to determine what is or is not IP. She agreed with the topic's importance and that fundamental changes are needed.

Mr. Bajraktari read aloud a comment from Peter MacKinnon: "IP is also subject to WIPO rules and conventions, so no country can go it alone. Trade secret is underutilized in my view as a novel way to protect such IP as software."

Mr. Louie commented that the WIPO rules are a good foundational set. He also noted that China has been much more aggressive than the US in moving in on standards and that their patents are foundational to having an advantage over one company over the next. Mr. Louie also commented that while he agrees that in many cases, trade secrets have been underutilized in software, given the nature of how software is created, it can be very challenging for any company to rely simply on trade secrets.

An NSCAI staff member also noted that there are benefits to both trade secrets and open source. Most recent ML breakthroughs have been from open source. As such, there is a need to examine the balance to make sure it is aligned with public-private partnerships.

Mr. Bajraktari read a question from Emma Rafaelof: "On this topic of IP and software, do you think that open source code will need to face more regulation? Have you thought of how legal protections can work for open source?"

Mr. Louie responded that it is a balance. Open source powered up great capabilities in software based on ability to build upon prior works. Mr. Louie notes that the United States needs to look holistically at this balance across all the different tools of IP.

AGENDA ITEM: CHAPTER 13 REVIEW AND DELIBERATION

Presentation of Proposed Recommendations:

Mr. Darby presented the draft Chapter 13 on microelectronics. Mr. Darby stated that Chapter 13's recommendations offer steps to rebuild U.S. leadership in microelectronics, starting with an explicit goal of staying two generations ahead of China in state-of-the-art microelectronics and maintaining multiple sources of cutting-edge merchant fabrication domestically. He outlined

three categories of recommendations: first, implementing a national microelectronics strategy; second, revitalizing domestic microelectronics fabrication; and third, doubling-down on federally funded microelectronics research.

Commissioner Discussion:

Dr. Schmidt noted his concern that the recommendations are not aggressive enough. He stated that the structure of the semiconductors industry is pushing leading firms and it will be difficult to push the kind of competitiveness needed.

Mr. Darby responded that it is always going to be hard to keep up in the race, and it will be expensive. He also noted that it is important for the government to focus on packaging.

Mr. Louie agreed and said that the fabrication challenge is clear, but it is also important to make tools available so that people can actually begin to construct components together. He noted that there is a lot of room for innovation in this area.

Dr. Matheny noted that NIST has done a good job of setting up access to manufacturing capabilities, but further consideration of methods of scaling would be helpful.

Mr. Jassy asked Dr. Schmidt what he meant by being more aggressive.

Dr. Schmidt responded that he is not exactly sure. He has served on other advisory groups that have attempted to talk about the U.S. semiconductor problem. He said that it may be preferable to approach the problem using subsidies, new technology, or Mr. Darby's recommendations on different packaging. However, if the future of AI is defined by chips not made in the US, then that is a national security risk and should be discussed.

Mr. Jassy responded that he believes that it is implicit in the report, but should be explicit. The United States is behind by a generation or two.

Dr. Horvitz agreed with Mr. Jassy and Dr. Schmidt, stating that it is important to call out the national security risks of continuing on the current path. He suggested that this should be emphasized more in the Final Report.

Mr. Louie noted that the issue is affecting the supply chain of innovation as well. He highlighted that U.S. semiconductor start-ups are struggling to get funding and are behind companies like TSMC. He noted that China is behind us in this area, but that playing the middle of the pack is not a strategy to win.

Dr. Matheny commented that the Line of Effort discussed how to convince TSMC and Intel to manufacture in the United States. Chapter 13 includes tax incentives as an effective nudge, however Dr. Matheny questioned whether there were other incentives that the Commissioners thought might be better.

Mr. Darby noted that contracts are always valuable as well. He also reinforced that we have not universally lost our edge in microelectronics. The U.S. has a very dominant position in toolsets and further investment is needed in those areas. He also noted that packaging is also important. Ultimately, Mr. Darby stated that if the U.S. does a combination of these actions, we can rebuild a very robust and strong position in microelectronics.

Mr. Jassy underlined that the U.S. should be vigilant about trying to have multiple fabs in the United States. The fact that the U.S. only had one leading edge-fab previously pushed people to TSMC.

Mr. Darby agreed with Mr. Jassy, noting that Intel is not a merchant fab, and the U.S. needs merchant fab capacity. He also commented that some legislation has been introduced to promote strong merchant fab investment.

Dr. Schmidt agreed that the United States needs competitive foundries that are state of the art. He expressed his concern that TSMC, Intel, and Samsung may be building fabs in the United States, but that their most advanced fabs are in Korea and Taiwan. He stated that leading fabs should be located in the United States and that the military needs good access.

Mr. Louie agreed that the fabs need to be state of the art. He also noted that the U.S. also needs operational skills to operate the plants.

Dr. Matheny stated that he was enthusiastic about making the chapter more ambitious. He noted that the time is right given the opportunity window provided by the NDAA and the President's agenda.

Mr. Bajraktari noted that the Commission staff will take the Commissioners' feedback and update the chapter accordingly.

AGENDA ITEM: CHAPTER 14 REVIEW AND DELIBERATION

Presentation of Proposed Recommendations:

Dr. Matheny presented the draft Chapter 14 of the Final Report. He highlighted several overarching themes which inform the Commission's recommendations:

- First, the United States must more closely integrate its tech protection policies with its policies to promote the U.S. technology sector. This will require a more strategic approach to technology policy, described in the Commission’s earlier recommendation to develop a National Technology Strategy, but also increased capacity in the key Departments responsible for tech protection, namely Commerce, Treasury, and State.
- Second, the United States should enhance its ability to monitor investments from competitors in critical U.S. technology industries.
- Third, export controls should be implemented judiciously and in conjunction with U.S. allies, targeting choke points key to competitors’ growth in sensitive industries.
- Fourth, the United States must build capacity to protect its research enterprise as a national asset. This will require government agencies, law enforcement, and research institutions to have ready access to tools and resources to conduct nuanced risk assessment and share information on specific threats and tactics.
- Finally, the United States should also guard against the entrance of researchers with problematic affiliations through implementation of a special visa review process for advanced degree students and researchers from designated countries of concern with ties to research institutions affiliated with foreign military and intelligence organizations. U.S. officials and diplomats should coordinate efforts with our international allies and partners, building a coalition committed to research integrity and sidelining those who do not abide by the values that underpin innovation and global science cooperation.

Commissioner Discussion:

Mr. Bajraktari asked an NSCAI staff member to provide further explanation.

An NSCAI staff member highlighted that there are a lot of areas where the United States is behind in this space. He noted that there have been good steps taken by Congress with ECRA and FIRRMA, but that the United States has not controlled a single technology under ECRA yet. The Administration has been guided to do more on this, but hasn’t taken action yet.

Hon. McFarland noted that the Material Critical Technology List failed because it wasn’t managed, supported, or understood. She stated that industry can help, but there must be a national security edge, not just a one-sided view.

Mr. Louie noted the importance of talent to the screening process as well.

Dr. Matheny read a question from Paul Nelson via YouTube: Two things perhaps to make more explicit for Chapter 14: (1) threats from non-state actors (firms, criminal groups); and (2) how to handle potential tensions with U.S. firms favoring fewer export controls.

Dr. Matheny responded, highlighting a recent example where the Department of Commerce put out an entity listing for the SMIC facilities in China that applied to U.S. products that were uniquely required for manufacturing semiconductors 10nm or below. He noted that it turns out

there are no U.S. products like that. U.S. companies pushed back on the prospect of such controls. Dr. Matheny noted that the government will need to understand the costs and benefits of those controls as well as what we lose in terms of revenue that would make us more competitive.

Dr. Moore expressed his concern about AI startups, noting that in Pittsburgh, robotic startups have had pressure to move outside of the United States because of the risk of export controls. He asked if there is a general concern about investing in startups inside the United States because of export controls.

Mr. Darby noted that this is a concern of all small companies. He stated that what the Commission hears most is that firms need clarity. They want quick answers and a streamlined process where it can be put in place.

Mr. Louie agreed that clarity is the answer. There have been a number of companies where they just didn't know. He provided an example where one company filed for an export license and it took three months before they were told they didn't need it. That lack of clarity is why it is important to be much more definitive on the export controls and the areas of concern.

Dr. Chien noted the indirect effects that impact companies. In the space sector, there are large partners that are not hugely supportive of this because they are concerned that if their products are on these large space crafts, they will be subject to export controls.

Hon. McFarland commented that currently, the least competent person is in charge of making those decisions. Right now an individual with no technical background is trying to identify what is or is not allowed to be exported. It will be important to highlight in the implementation plan how that is constructed.

AGENDA ITEM: CHAPTER 15 REVIEW AND DELIBERATION

Presentation of Proposed Recommendations:

Dr. Matheny presented the draft Chapter 15 of the final report. He explained his views of the U.S. strengths--asymmetric advantages--compared to China that are difficult for China to replicate. The first advantage is the talent competition, which the U.S. does incredibly well and needs to keep doing. The second advantage is the U.S. position in the global microelectronics supply chain. The third advantage, found in this chapter, is that the U.S. has friends, allies, and partners around the world that have a shared commitment to values. In this chapter, NSCAI focused on how to marshal our allies and partners around our shared values and technical standards. The Commission recommends the State Department work with allies and partners to

synchronize international assistance funds and shape standards and norms to comport with shared values such as openness, privacy, etc. The State Department should also work with NIST on international standards setting to ensure the international bodies remain neutral. The State Department and DHS should work together to leverage existing visa programs to ensure foreign talent can support U.S. AI work. The Commission also recommends the State Department continue with a plan to set up a new bureau focused on cyber and emerging technology issues. The State Department will need additional resources from Congress to pursue technology diplomacy as a central feature to U.S. foreign policy. The Commission recommends a new, technology focused undersecretary position in the State Department.

Commissioner Discussion:

Dr. Schmidt noted that it seems as though the State Department took the Commission's initial recommendations very strongly. He stated his belief that the Commission is going to have a big win there.

Dr. Matheny agreed and noted the encouraging and constructive work of their colleagues.

An NSCAI staff member asked Dr. Matheny to speak more about the recommendation to create the Emerging Technology Coalition.

Dr. Matheny noted that there have been a lot of different proposals for creating new technology alliances, including new treaty alliances. The Commissioners' view is that we should be leveraging a less formal framework where members of a coalition can organize their activities, without organizing new treaties. Instead, a coalition is needed to leverage existing multilateral mechanisms.

Mr. Bajraktari read aloud a question from Peter Brown: "Given the increased role of IT standardization globally, any thoughts regarding the need to prepare and train a cadre of public and private sector actors to engage in defending their case in the increasingly competitive standards world? Is this purely a State Department responsibility for defending US interests or does it go deeper?"

Dr. Matheny responded that it does go deeper. In particular, NIST plays a key role in this. The Commission has called for a task force that would include NIST, State, USAID, and others. He noted that the United States needs to be more present than we have been historically.

Mr. Bajraktari read a question from Geoff Odlum: "Does the Commission believe there is interest among US tech companies to work closely with the State Department?" He also read a comment from Paul Nelson: "A couple points to highlight for Chapter 15 --- (1) US interests are

advanced via strong engagement on development assistance. To build skills, create overseas partners (firms, academia), etc.”

Dr. Matheny responded that there is strong interest in U.S. technology. He noted that U.S. companies have had a front row view of strong arm tactics and voting block and they are concerned about how standard-setting might be manipulated. Ensuring that processes are fair is something that they are very interested in. Regarding the question about highlighting engagement of development assistance, Dr. Matheny noted that it is not just about technology and infrastructure, but also about skill building.

Dr. Horvitz commented on the interrelation between chapters, noting that Chapter 15 dovetails nicely with Chapters 7 and 8.

Mr. Bajraktari noted that the Commission staff will do that for the new iteration of the report.

Dr. Matheny expressed his agreement with Dr. Horvitz.

An NSCAI staff member added in response to Mr. Nelson’s comment that the Commission also looked at the USAID digital strategy as well. He noted that it is one of many programs that build into the concept of synchronizing and improving government assistance that Dr. Matheny discussed.

Mr. Louie commented that many allies hope to be able to work more closely with the United States. The more sharing of resources, the faster we will be able to get down the path of developing next generation AI.

AGENDA ITEM: CHAPTER 16 REVIEW AND DELIBERATION

Presentation of Proposed Recommendations:

Mr. Louie presented the draft Chapter 16 which focuses on associated technologies. He notes that AI is not a single technology, but a collection of tools and techniques that rely on and can be applied to other fields. Recognizing this, Congress included both AI and its “associated technologies” in the Commission’s mandate. In Chapter 16, the Commission argues that the United States must not pursue leadership in AI as an end unto itself, but as one part of a broader strategy to promote U.S. technological and economic competitiveness in key technologies. The Commission also proposes a preliminary list of key technologies and provides specific actions to ensure U.S. leadership in each. I will briefly summarize our recommendations on biotechnology, quantum computing, 5G, robotics, advanced manufacturing, and energy systems.

Commissioner Discussion:

Dr. Schmidt asked a question about the biotechnology recommendations. He stated that it seems as though the right thing to do is to build the equivalent of a cloud based system which could be built by powerful AI systems. He inquired if that is the type of recommendation included in Chapter 16.

Mr. Louie that it needs to be thought of as an end to end ecosystem. It is not just the discovery of the appropriate drug for example, but also getting through the regulatory process that ensures safety. He stated that a broader strategy is needed, as biotechnology is going to be a transformative area in the fourth industrial revolution.

Mr. Darby noted that Dr. Schmidt raised an important idea. He stated that, from a data side, we don't have an equivalent to BGI (formerly the Beijing Genomics Institute). He argued that the United States needs to have a national strategy around data sets that underpin bio-innovation. This is important because AI needs the data. Mr. Darby noted that the process pipeline--bug to drug or data to innovation--starts with data and the United States needs a national strategy around biodata in a big way.

Dr. Schmidt suggested incorporating that idea into the Final Report.

Mr. Louie agreed.

Mr. Bajraktari read a question from Peter MacKinnon: "Has the potential of quantum-based cyber threats being considered in this or other chapters? Further, what are the implications of quantum breakthroughs in the next 10 years wrt to this initiative?"

Mr. Louie noted that the ability to use quantum computers to break RSA encryption is still a way off. Further, quantum computers are noisy, and can have high error rates. However, he noted that the United States must think about systems that are quantum resistant. Several startups are looking in the quantum resistant areas as is NIST. Mr. Louie remarked that quantum can transform how we do sensing, and that sensing is critical for AI. He stated that there are many areas of applications that go beyond standard base compute.

Mr. Bajraktari read a question from Ryan Schadt:" The Commission mentioned the USG has not identified key emerging tech. Does this include recognition of the NSC's Oct 2020 National Strategy on Critical and Emerging Technology?" He also read a question from Peter MacKinnon: "Why only energy storage? What about energy generation and distribution technologies and know-how (e.g., SMRs)?"

Mr. Louie responded that energy is a big field and other areas are reasonable fields as well. As it applies to national security systems, particularly systems that need to be mobile or autonomous in the field, the key limiting factor or concern is energy storage. He noted that the United States does not want to trade protection for energy. Mr. Louie stated that energy production is important, but storage is something the United States really needs to figure out.

Dr. Moore agreed that he would hate to be in a situation where adversaries could field robots that could survive for days or weeks and the United States didn't also have that capability.

Dr. Matheny deferred to others on the NSC question, but expressed his understanding that the United States is waiting for a document from the Department of Commerce that would define critical technologies for the purposes of ECRA and export controls. The October report from the White House does not answer that call.

An NSCAI staff member explained that they are two different lists -- the ECRA list and the White House strategy -- which are disconnected. The Strategy had about 20 technologies listed, but there was no strategy with it explaining the importance of those technologies. He stated that there has to be another level beyond that.

Dr. Schmidt suggested that this should be heavily promoted, especially given that China has a strategy and the United States does not. He stated that it would be useful to build consensus on what the list is. He offered his own opinion on the list as including: semiconductors software, AI, various forms of synthetic bio, various forms of energy, quantum. Dr. Schmidt noted that a list would also be important because that list would guide funding, loan guarantees, etc. He stated that the United States needs to build a consensus at a national level.

Mr. Louie added that the issue is not just the creation of a list, but also a national strategy.

Hon. McFarland noted that this is another element of the whole-of-government response needed in this area. She remarked that the 16 chapters of the Final Report are different pieces of a whole government response that is needed.

Mr. Bajraktari agreed, noting that Part II of the Final report provides a strong foundation for a national technology strategy. All of these elements are for the Executive and Legislative branch to take action.

After the conclusion of the discussion on Chapter 16, Dr. Schmidt briefly polled the Commissioners to determine if they were happy with where the Commission was with the draft Final Report chapters. Commissioners responded with general consensus on the draft chapters.

Dr. Schmidt then suggested that the Commissioners listen to more questions and comments from the public.

Mr. Bajraktari read aloud some written comments from the public that the Commission received prior to and during the meeting. He also posed questions from the public to the Commissioners for answers. All received comments are included in an appendix to these minutes.

In closing, Mr. Bajraktari noted that the Commission staff will update the Final Report based on Commissioner feedback and will begin drafting implementation plans for Commissioner review in February. Following that meeting, all portions of the Final Report will be packaged for final Commissioner review on March 1, 2021.

AGENDA ITEM: CLOSING REMARKS

Dr. Schmidt and Hon. Work gave closing remarks.

ADJOURNMENT:

The meeting was adjourned at 2:45 PM EST by Ms. Ponmakha, the Designated Federal Officer.

Meeting minutes prepared by: Commission Staff

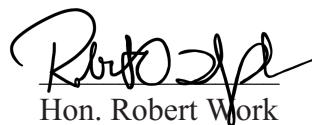
Approved and signed by the Commission's Designated Federal Officer: March 29, 2021

Ms. Angela Ponmakha
Designated Federal Officer

Approved and signed by the Commission's Chair and Vice Chair: March 29, 2021



Dr. Eric Schmidt
Chair



Hon. Robert Work
Vice Chair

Appendix: Public Comments and Questions Received for the January 25-26, 2021 Meeting:

Comments/Questions received through event registration or email:

Sarah Cammarata: Do you expect the Biden administration to take a hardline policy against China and make AI a priority in the White House? What is the first thing that the administration can do to implement some of your recommendations to counter China and act with the urgency you are arguing for? Also, if there were one or two things you would want DoD to take away from this report, what would that be?

Michael Klare: What measures do you recommend to prevent the unintended or accidental outbreak of nuclear war arising from increased reliance on AI-enabled computer-assisted battlefield decision-making?

Tom Runyon: The majority of the software and tools government contractors and agencies, themselves, will use to develop AI applications are open source. Additionally, most commercial AI that the world already uses (and you recommend swift adoption of) are open source. Will the Commission's final report address how the U.S. government should engage in/promote open source project and contributions? There's nothing preventing China from creating its own open source foundry. If Chinese contributions to open source projects outweigh or outnumber U.S. contributions the US government will be significantly disadvantaged and our attack vector will continue to widen. Does the commission have recommendations to address this and make sure the US remains the leader in open source software contributions?

Jonathan Rodriguez Cefalu: I hope that the final report will make a strong and unambiguous statement that the US will cooperate with our adversaries to prevent existential risk to humanity, a.k.a. global catastrophic risk.

The wording used by Dr. Matheny in his Oct 28, 2020 podcast episode was promising:

"In fact our next report from the Commission is going to focus on cooperation with our competitors as being a key policy question - one that we really have to get right. The United States even during its deepest competition with the Soviet Union still found ways to cooperate on things that were of mutual benefit. That included arms treaties, it included scientific cooperation in areas of civilian science, space cooperation for example, on the Apollo-Soyuz program, the Pugwash Conferences in which scientists from both countries could meet and discuss candidly their concerns about security, and even offers to share certain kinds of weapons technologies that we thought would ultimately lead to greater strategic stability, like the offer by the United States to share its Permissive Action Links which prevented unauthorized use of nuclear weapons. We

think all of those should be pursued as concepts with our competitors but we need to find effectively the Permissive Action Link for A.I., that is a safety technology that you would want your competitors to use, just as you'd want yourself to use it. And we need to open these dialogues for scientific cooperation that would be mutually beneficial." – Dr. Jason Matheny

In addition to including a statement along the lines of what Dr. Matheny said, I humbly suggest that the Commission must go a step further and specifically highlight these two specific risks which we will work with our adversaries to mitigate:

[1] The threat of Paperclip Maximizer scenarios. <https://www.lesswrong.com/tag/paperclip-maximizer>

[2] The threat of unwanted nuclear war through the escalatory interaction of multiple nations' automated military decision support systems, leading a small conflict to escalate to nuclear war at "machine speed" - the warfare equivalent of the 2010 stock market flash crash, but in this case causing not a stock market hiccup but a nuclear conflagration.

It is imperative that the Commission call out specific concrete steps to work with our adversaries' scientists and government. We, China, and Russia must work together against the #1 danger to mankind, which is not human enemies or climate change, but is uncontrolled artificial intelligence escaping its chains.

Comments/Questions received during the meeting via YouTube:

The below is a copy of the comments and questions the public submitted via the NSCAI YouTube meeting livestream comment section. These have not been edited, except for a few minor spelling or grammatical mistakes.

Day 1 YouTube Comments:

Chris: Many GW-N 2.0 cannot simply mandate education: it will be ineffective without a Key West equivalent. Historical kinetic and evolving non-kinetic "cultures" need intentional, not inertial, change.

Andrew Kemendo: We can only do so much from inside the DoD. We need congress to make real changes in law for hiring, salary, acquisitions and data/API mandates. How do we make progress with lawmakers?

Paul Nelson: National security threats also might be posed by excessive concentrations of market power within the AI industry or industries that deploy AI-enabled services.

Rodrigo Vargas: This is very interesting theme, Cheers from Chile :)

Ryan Schadt: Question, we discuss the novel cyber vulnerabilities in AI/ML models and data. How do stack the concerns and ease of these cyber vulnerabilities in AI/ML with need of ally and partner AI integration?

Jonathan Rodriguez Cefalu: This section is excellent and extremely important. This will help save millions of lives.

Geoff Odlum: Regarding the recommendation to fund technical means to verify compliance with future AI arms control agreements: How? What technical verification measures do you envision?

Rodrigo Vargas: nuclear weapons right only humans, remember the Able Archer 83

Peter MacKinnon: Landmines are a type of autonomous system. Much of the world has come to ban such weapons. Does this set a precedent for the debate about autonomous weapons? Thanks

Michael Bock: How can we "control" AI usage in weapon systems, there is no "AI Arms control mechanism" in place?

Andy Lacher: What role can run-time assurance capabilities play in ensuring that AI/autonomous systems operate within acceptable bounds?

Peter MacKinnon: Thanks for the excellent answers.

Michael Bock: Mr. Work: Does this not require to public the algorithms?

Cindy M: Are you concerned that analysts will become biased or overly dependent on AI-enabled intelligence (particularly around the forecasting function that was mentioned.)

Peter MacKinnon: Has the potential of quantum-based cyber threats being considered in this or other chapters? Further, what are the implications of quantum breakthroughs in the next 10 years wrt to this initiative?

Enrique Oti: DoD must experiment and take risks related to multi-level security systems. Attempting to eliminate all data leak risk introduces severe operational risk since we cannot modernize data fusion/AI.

Dean Souleles: Do we need to go further in recommending structural changes to the IC to empower the DNI with authorities commensurate with responsibilities across the IC?

Dean Souleles: As Jason said we need to go further in enforcing existing policies (eg clearance reciprocity) but the DNI has few tools at her disposal.

Rodrigo Vargas: An Andrew Walter Marshall of Technology?

Peter MacKinnon: Thanks

Andy Lachert: thank you

Kolja Verhage: Are there any thoughts on how government can offset the impact or costs on the algorithm supply chain by the potential imposition of ethical and non-biased performance requirements for AI algorithms?

Cindy M: How would you recommend empowering Responsible AI leads, so that individuals have the authority needed to ensure AI systems aren't fielded unless they meet an agency's safety and ethical thresholds?

Jonathan Rodriguez Cefalu: Page 16 of the report says the US should "not shy away" from working on Artificial General Intelligence. Isn't AGI work very dangerous since the AI community has not solved the A.I. Alignment problem?

Jack Poulson: Does the NSCAI assess that the DoD's usage of Clearview AI, X-Mode, and Everalbum (dba Paravision) violated the AI Principles commitment to auditable data?

Peter MacKinnon: How do these entities compare and interface with the newly approved National AI Initiative approved by Congress Dec 3rd?

Peter Brown: Will the proposed TCC have only an executive role or also involve Congress, particularly when considering possible international aspects of this important work?

Paul Nelson: A critical point on competitiveness -- we cannot compete globally on AI, if our domestic AI ecosystem is not itself competitive but rather made up of just a few firms with undue market power.

Russell Hanser: Thank you all for these discussions today.

Peter MacKinnon: Thanks

Peter Brown: Yll, it can wait until tomorrow indeed

Rodrigo Vargas: Thanks to all, was very interesting ... Cheers from Chile :)

Rob Goodson: Thank you all for the commission discussion. Looking forward to tomorrow!

Geoff Odlum: Big thanks to all NSCAI Commissioners and staff for this thoughtful public discussion, and even more so for the time and effort devoted to writing this critically important final report.

Jonathan Rodriguez Cefalu: +1

Kolja Verhage: Thanks to all. This has been great. Looking forward to tomorrow!

Peter Brown: Excellent. Catch up tomorrow

Day 2 YouTube Comments:

Peter MacKinnon: Have you considered a mentorship approach to talent development within the target community and the Government more generally for attracting global talent? Thanks.

Paul Nelson: A concern on R&D --- a key gap is a comparative lack of resources for objective, clear-eyed research on societal impacts. R&D can't just be about "tech," but also societal & governance questions.

Rodrigo Vargas: only say ,great stuff here for second day here....Cheers from Chile :)

Julia Knox: Hello and thank you for your presentation today. How do you plan to attract and retain underrepresented individuals in AI/ML/data science careers within the government?

rob walker: You mention funding for DoE, NSF, NIH, NIST, and NASA, but not DoD. Since this is a National Security Commission, why no increase in DoD research funding?

Peter Brown: Given the increased role of IT standardization globally, any thoughts regarding the need to prepare and train a cadre of public and private sector actors to engage in defending their case in the increasingly competitive standards world? Is this purely a State Department responsibility for defending US interests or does it go deeper?

Jonathan Rodriguez Cefalu: Would the commission also be willing to make a recommendation about the importance of investing urgently in AGI Safety? E.g. the problems raised in Stuart Russell's book Human Compatible.

Paul Nelson: To Eric's point, the ability of universities to support rigorous, independent AI research should not be a function of how successful they are in forming arrangements with commercial actors.

Peter MacKinnon: What about the idea of a National AI & Autonomous Systems Lab with technical, social, legal and economic talent to serve national needs, as per this report under discussion?

rob walker: Chapter 10 question: U.S. doesn't hire non-citizens for national security positions. Why so much emphasis on recruiting students and workers we can't hire?

Paul Nelson: Thanks, Andrew -- ultimately, it's a question of what influences the quality of research. And a hallmark of a "US values" model has to be our forthright attention not just to AI growth, but AI risk.

Jack Poulson: What does the commission feel is lacking from NSF and DOE supercomputing centers, which have a long history of giving academics access to large HPC systems?

Peter MacKinnon: Comment: IP is also subject to WIPO rules and conventions, so no country can go it alone. Trade secret is underutilized in my view as a novel way to protect such IP as software.

Emma Rafaelof: On this topic of IP and software, do you think that open source code will need to face more regulation? Have you thought of how legal protections can work for open source?

Peter MacKinnon: Thanks

Peter MacKinnon: A transition in computing is on the horizon with respect to the rise of quantum computing and quantum encryption. What does this chapter have to say about this transition anticipated?

Paul Nelson: Two things perhaps to make more explicit for Chapt. 14: (1) threats from non-state actors (firms, criminal groups); and (2) how to handle potential tensions w/ US firms favoring fewer export controls.

rob walker: How about research into physical protections that help prevent reverse engineering and technology to identify counterfeits?

Geoff Odlum: Excellent work by the LOE5 team. Does the Commission believe there is interest among US tech companies to work closely with the State Department?

Paul Nelson: A couple points to highlight for Chapter 15 --- (1) US interests are advanced via strong engagement on development assistance. To build skills, create overseas partners (firms, academia), etc.

Emma Rafaelof: Do you also see a role for USTDA in tech diplomacy?

Jonathan Rodriguez Cefalu: Is there the possibility to work with UN members on AGI Safety? It seems very dangerous that the NSCAI is recommending to work on AGI when AGI could kill off all of humanity if we are unlucky.

Kolja Verhage: The argument for Transatlantic cooperation seems focused on competition with China. Is there a risk that this competitive focus makes us overlook opportunities for collaboration on shared interests?

Paul Nelson: (2) recall new initiatives like the USAID Digital Strategy -- and consider how they present opportunities for particular attention to AI issues.

Paul Nelson: (3) for AI ecosystems to evolve/grow in a manner aligned w/ US values, the environment in which they grow needs institutions and norms in place to support and foster them. The USG can help w/ that.

Paul Nelson: (4) finally, from an interagency standpoint, if a USG task force is developed, it's not just about directing USG efforts, but facilitating/empowering agencies within their respective domains.

Peter Brown: @Paul Nelson agree on all 4 points - we have the same challenges in the EU

Ryan Schadt: The Commission mentioned the USG has not identified key emerging tech. Does this include recognition of the NSC's Oct 2020 National Strategy on Critical and Emerging Technology?

Peter MacKinnon: Why only energy storage? What about energy generation and distribution technologies and know-how (e.g., SMRs)?

Jonathan Rodriguez Cefalu: Before the Commission adjourns it would be wonderful if it would please be possible to address the elephant in the room which is the horrible danger AGI poses to lesser/slower beings such as humans. Raised this question in previous chapter discussions as well but since it has not been addressed yet it would be wonderful if it could please be considered here as it relates to Autonomy.

Peter MacKinnon: Thanks for an excellent set of presentations and discussions

Rodrigo Vargas: Thanks

Peter MacKinnon: Is there a target date for release?

Kolja Verhage: Thanks Jason, very interesting!

Paul Nelson: Are you satisfied with how you so far have paid attention to ethics, equity, and responsible AI innovation? For example:

Peter MacKinnon: As mentioned earlier, what about the idea of a National AI & Autonomous Systems Lab with technical, social, legal and economic talent to serve national needs, as per this report under discussion?

Paul Nelson: types of research supported by more R&D; design of AI certifications/curricula; attention paid to shaping industry-level norms; policy frameworks adopted by US allies and partner gov'ts.

NSCAI: Hi Peter, thank you for your question. The Commission plans to formally approve and submit our final report on March 1, 2021.

Peter MacKinnon: Thanks re the release date.

Jonathan Rodriguez Cefalu: Would it please be possible to directly speak to the fact that Stephen Hawking and many others have described the creation of AGI as a likely extinction event. It seems irresponsible to ignore this. Especially as this is a public commission and should give consideration to all pertinent questions which the above question is. Thank you very much NSCAI team.

rob walker: Thank you for the responses! I like the emphasis on domestic pipeline. Lets figure out how get more females and minorities into AI/ML. That would be a huge boost.

Paul Nelson: Thanks for the discussion / tempered self-congratulation -- in this case, very merited.

Peter Brown: I would like to take the opportunity to mention the intention of the European Parliament's special committee on AI to extend an invitation to the NSCAI to present its work at a forthcoming hearing in March. We will follow up with the secretariat.

Peter MacKinnon: What is the future of the Commission?

Peter Brown: Congratulations to all!