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July 18, 2019

Dr. Walter G. Copan
Under Secretary of Commerce for Standards and Technology
Director, National Institute of Standards and Technology
100 Bureau Drive, Stop 2000
Gaithersburg, MD 20899

RE: *U.S. Leadership in AI: Plan for Federal Engagement in Developing Technical Standards and Related Tools*

Dear Under Secretary Copan:

The following comments are submitted by Hitachi Group companies doing business in the United States (Hitachi) in connection with the National Institute of Standards and Technology (NIST) Draft *U.S. Leadership In AI: A Plan for Federal Engagement in Developing Technical Standards and Related Tools*, published on July 2, 2019 and released for public comment.

Background

Founded in 1910 and headquartered in Tokyo, Japan, Hitachi, Ltd. is a global technology conglomerate answering society's most pressing challenges through cutting-edge operational technology (OT), information technology (IT), and products/systems. A Social Innovation leader, Hitachi, Ltd. delivers advanced technology solutions in the mobility, human life, industry, energy, and IT sectors. The company's consolidated revenues for FY2018 (ended March 31, 2019) totaled $86.2 billion, and its 803 companies employ 295,000+ employees worldwide.

Since establishing a regional subsidiary in the United States in 1959, Hitachi has been a committed American partner. For over thirty years, it has invested heavily in research and development (R&D) in the U.S., and this continued reinvestment has resulted in 11 major R&D centers that support high-skilled jobs in manufacturing and technology. Dedicated to delivering the technologies of tomorrow, Hitachi recently opened a Center for Innovation in Santa Clara, California, to explore applications in machine learning, artificial intelligence, Internet of Things (IoT) devices, data analytics, and autonomous vehicles among other advanced technologies. Hitachi is also proud of its human capital investment, supporting 21,000 employees across 88 companies. At 13% of total revenue, North America represents Hitachi, Ltd.'s second largest market, generating $10.9 billion in revenue in FY2018.

Hitachi commends NIST for its comprehensive federal engagement plan, and welcomes the opportunity to engage with the U.S. government as it sets standards that will determine America's standing as a global leader in artificial intelligence (AI).

Responses to NIST Draft Report

Trustworthiness

NIST correctly notes that AI's widespread adoption in the global marketplace is contingent upon public trust in its application. Furthermore, the draft rightly catalogues characteristics that "relate to trustworthy AI technologies" (page 5): accuracy, reliability, robustness, security, explainability, safety, and privacy. NIST should spearhead the creation of common, international definitions and standards around these characteristics, while also introducing "ethics" as an additional characteristic. Timeliness must also be considered when creating standards and definitions. In real-time applications such as autonomous

vehicles, control systems, etc., AI must satisfy tight-response time constraints to establish trust. Such standards should include all design elements and provide testing options throughout all stages of AI solution development to create trustworthy AI.

Standards-Related Tools / Accountability and Auditing

The list of standards-related tools "to advance the development and adoption of effective, trustworthy AI technologies" (page 9) is comprehensive and conducive to ensuring the development of robust standards. The inclusion of "tools for accountability and auditing" (line 210) is especially laudable, as accounting and auditing tools are critical to the development of human-interacting AI. Effective auditing tools could make developer accountability clear should questions or concerns surrounding ethics arise from co-developers, service providers, or end-users.

To design the most effective auditing tools, language detailing the inherent tension between consumer-driven calls for transparency and developer/service provider calls for IP protection should be included in this section. A fulsome description of this tension should lead to a more constructive dialogue, as well as the development of auditing tools that account for greater nuance and on-the-ground business realities.

Additionally, Hitachi encourages NIST to review whether this inherent tension could be alleviated through an internationally-recognized certification mechanism. A public certification marking or symbol could bolster public trust that an AI model has been reviewed and tested, and is fully accountable—even if the central algorithm or core technology that meets that accountability standard is not disclosed.

Finally, NIST should develop benchmarks/evaluations for AI applications, both horizontal and vertical (i.e. for manufacturing, healthcare, energy, mobility, etc.), in concert with private sector stakeholders with rich expertise in these areas. With deep domain expertise in a variety of verticals and a legacy of horizontal co-creation, Hitachi is uniquely suited—and ready—to assist NIST in benchmarking across industries.

Data

NIST should work to ensure that there are strong standards developed around data, as it is the critical component of AI systems (page 10). Furthermore, NIST should function as the lead source for testing methods that establish dataset accuracy, privacy, data leakage, reproducibility, provenance, and identify bias.

Voluntary Consensus Standards Process

NIST notes that the U.S. relies on voluntary consensus standards developed in partnership with the private and public sectors (page 16). The federal government should continue to convene private and public sector actors to promote a consensus approach and to further incorporate these consensus standards into federal procurement requests. It is also critical that NIST and other U.S. government agencies participate in international standards setting organizations to promote a market-based approach to AI standards development. This includes participation in bodies developing IT standards that are integral to AI systems (cloud computing, cyber security, Internet of Things (IoT), etc.). As a technology leader in Japan with a global footprint, Hitachi is well-positioned to partner with NIST and appropriate U.S. government agencies by leveraging its expertise in U.S., Japan, and EU privacy guidelines; AI; and data. As the draft plan observes, the standards-setting process must be able to move quickly as technology develops, so NIST should be mindful of promoting a process that produces the most reliable, timely, and robust standards in a manner that can be easily applied and adjusted. Private sector partnerships will be critical to such a process, and Hitachi stands ready to assist in that process design.

Agencies Determining Their AI Standards Needs

As detailed in the draft plan, the federal government must understand how AI will impact its operations and what potential standards are available for adoption before moving forward (page 15). It is important to note that standards in some areas are cross-cutting and applicable no matter the federal department. In fact, all the focus areas around trustworthiness are foundational to any federal government use of AI systems. Once created, all federal agencies should use these as a baseline for their AI program adoption. Once these foundational standards are applied, each agency will need to consider more enhanced standards based on the application of the program.

Recommended Federal Government Standards Actions to Advance U.S. AI Leadership

The draft plan details four recommended action items the federal government should pursue to advance U.S. AI interests (page 16), and Hitachi is uniquely qualified to contribute to the development of AI-standards related policies and regulatory policies.

Products and services that provide real-time feedback features will be important in the IoT and 5G eras, and Hitachi has deep expertise in real-time OS, such as TRON (listed in IEEE-standardization). Hitachi's R&D activities cover many research topics in AI including Industrial AI, IoT, 5G, and cyber physical systems, and policy development collaboration opportunities exist with the company's R&D partners.

Finally, NIST's four action items (and their related metrics) are sufficient for ensuring American competitiveness, and Hitachi would simply emphasize the following:

- Please add aspects on AI utilization to the statement "Address the need to monitor and manage AI systems throughout the entire product lifecycle" (page 18, line 513); (page 15, line 352).
- AI utilization is critical to realizing human-interacting AI, and the following guidelines exist, in addition to the reference to ISO/IEC in Appendix II (page 20, lines 543-550).
    1) Guidelines for AI utilization published by the Ministry of Internal Affairs and Communication in Japan
    2) Guidelines published by OECD in May 2019 address the "AI system lifecycle," which is closely related to AI utilization
- The OECD guidelines may help each organization consider technical standards and related tools, and the draft plan would benefit greatly if OECD guideline language was incorporated throughout

Conclusion

Hitachi appreciates NIST's vigorous effort to implement President Trump's February 11, 2019 Executive Order (EO 13859) on securing the country's leadership in AI, and is ready to assist the federal government as it works to develop internationally agreed-upon, consensus-based standards that promote trustworthiness and widespread AI adoption.

Sincerely,

Koji Takaichi
President & CEO
Hitachi America, Ltd