responsibility of individuals on assignment at the Institute under the Intergovernmental Personnel Act of 1970 [42 U.S.C. 4701 et seq.] who are performing duties under subsection (d).

(e) Review of program

(1) Periodic review

The Director shall periodically review the portfolio of research awards monitored by each program manager designated in accordance with subsection (d). In conducting those reviews, the Director shall seek the advice of the Computer System Security[1] and Privacy Advisory Board, established under section 278g–4 of this title, on the appropriateness of the research goals and on the quality and utility of research projects managed by program managers in accordance with subsection (d).

(2) Comprehensive 5-year review

The Director shall also contract with the National Research Council for a comprehensive review of the program established under subsection (a) during the 5th year of the program. Such review shall include an assessment of the scientific quality of the research conducted, the relevance of the research results obtained to the goals of the program established under subsection (d)(3)(A), and the progress of the program in promoting the development of a substantial academic research community working at the leading edge of knowledge in the field. The Director shall submit to Congress a report on the results of the review under this paragraph no later than 6 years after the initiation of the program.

(f) Definitions

In this section:

(1) Computer system

The term ''computer system'' has the meaning given that term in section 278g–3(d)(1)[2] of this title.

(2) Institution of higher education

The term ''institution of higher education'' has the meaning given that term in section 1001(a) of title 20.

(Mar. 3, 1901, ch. 872, § 22, as added Pub. L. 107–305, § 8(a)(2), Nov. 27, 2002, 116 Stat. 2375.)

§ 278h–1. Standards for artificial intelligence

(a) Mission

The Institute shall—

(1) advance collaborative frameworks, standards, guidelines, and associated methods and techniques for artificial intelligence;

(2) support the development of a risk-mitigation framework for deploying artificial intelligence systems;

(3) support the development of technical standards and guidelines that promote trustworthy artificial intelligence systems; and

(4) support the development of technical standards and guidelines by which to test for bias in artificial intelligence training data and applications.

(b) Supporting activities

The Director of the National Institute of Standards and Technology may—

(1) support measurement research and development of best practices and voluntary standards for trustworthy artificial intelligence systems, which may include—

(A) privacy and security, including for datasets used to train or test artificial intelligence systems and software and hardware used in artificial intelligence systems;

(B) advanced computer chips and hardware designed for artificial intelligence systems;

(C) data management and techniques to increase the usability of data, including strategies to systematically clean, label, and standardize data into forms useful for training artificial intelligence systems and the use of common, open licenses;

(D) safety and robustness of artificial intelligence systems, including assurance, verification, validation, security, control, and the ability for artificial intelligence systems to withstand unexpected inputs and adversarial attacks;

(E) auditing mechanisms and benchmarks for accuracy, transparency, verifiability, and safety assurance for artificial intelligence systems;

(F) applications of machine learning and artificial intelligence systems to improve other scientific fields and engineering;

(G) model documentation, including performance metrics and constraints, measures of fairness, training and testing processes, and results;

(H) system documentation, including connections and dependences within and between systems, and complications that may arise from such connections; and

(I) all other areas deemed by the Director to be critical to the development and deployment of trustworthy artificial intelligence;

(2) produce curated, standardized, representative, high-value, secure, aggregate, and privacy protected data sets for artificial intelligence research, development, and use;

(3) support one or more institutes as described in section 9431(b) of this title for the purpose of advancing measurement science, voluntary consensus standards, and guidelines for trustworthy artificial intelligence systems;

(4) support and strategically engage in the development of voluntary consensus standards, including international standards, through open, transparent, and consensus-based processes; and

(5) enter into and perform such contracts, including cooperative research and development arrangements and grants and cooperative agreements or other transactions, as may be necessary in the conduct of the work of the National Institute of Standards and Technology and on such terms as the Director considers appropriate, in furtherance of the purposes of this division.[1]

(c) Risk management framework

Not later than 2 years after January 1, 2021, the Director shall work to develop, and periodically update, in collaboration with other public and private sector organizations, including the National Science Foundation and the Department of Energy, a voluntary risk management framework for trustworthy artificial intelligence systems. The framework shall—

(1) identify and provide standards, guidelines, best practices, methodologies, procedures and processes for—

(A) developing trustworthy artificial intelligence systems;

(B) assessing the trustworthiness of artificial intelligence systems; and

(C) mitigating risks from artificial intelligence systems;

(2) establish common definitions and characterizations for aspects of trustworthiness, including explainability, transparency, safety, privacy, security, robustness, fairness, bias, ethics, validation, verification, interpretability, and other properties related to artificial intelligence systems that are common across all sectors;

(3) provide case studies of framework implementation;

(4) align with international standards, as appropriate;

(5) incorporate voluntary consensus standards and industry best practices; and

(6) not prescribe or otherwise require the use of specific information or communications technology products or services.

(d) Participation in standard setting organizations

(1) Requirement

The Institute shall participate in the development of standards and specifications for artificial intelligence.

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[1] See References in Text note below.

(2) Purpose

The purpose of this participation shall be to ensure—

(A) that standards promote artificial intelligence systems that are trustworthy; and

(B) that standards relating to artificial intelligence reflect the state of technology and are fit-for-purpose and developed in transparent and consensus-based processes that are open to all stakeholders.

(e) Data sharing best practices

Not later than 1 year after January 1, 2021, the Director shall, in collaboration with other public and private sector organizations, develop guidance to facilitate the creation of voluntary data sharing arrangements between industry, federally funded research centers, and Federal agencies for the purpose of advancing artificial intelligence research and technologies, including options for partnership models between government entities, industry, universities, and nonprofits that incentivize each party to share the data they collected.

(f) Best practices for documentation of data sets

Not later than 1 year after January 1, 2021, the Director shall, in collaboration with other public and private sector organizations, develop best practices for datasets used to train artificial intelligence systems, including—

(1) standards for metadata that describe the properties of datasets, including—

(A) the origins of the data;

(B) the intent behind the creation of the data;

(C) authorized uses of the data;

(D) descriptive characteristics of the data, including what populations are included and excluded from the datasets; and

(E) any other properties as determined by the Director; and

(2) standards for privacy and security of datasets with human characteristics.

(g) Authorization of appropriations

There are authorized to be appropriated to the National Institute of Standards and Technology to carry out this section—

(1) $64,000,000 for fiscal year 2021;

(2) $70,400,000 for fiscal year 2022;

(3) $77,440,000 for fiscal year 2023;

(4) $85,180,000 for fiscal year 2024; and

(5) $93,700,000 for fiscal year 2025.

(Mar. 3, 1901, ch. 872, §22A, as added Pub. L. 116–283, div. E, title LIII, §5301, Jan. 1, 2021, 134 Stat. 4536.)

REFERENCES IN TEXT

This division, referred to in subsec. (b)(5), probably means div. E of Pub. L. 116–283, Jan. 1, 2021, 134 Stat. 4523, which is classified principally to chapter 119 of this title.

§ 278i. Reports to Congress

(a) Information to Congress on Institute activities

The Director shall keep the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science, Space, and Technology of the House of Representatives