中国电子技术标准化研究院
China Electronics Standardization Institute

National AI Standardization Work Report

July 8, 2025
Beijing

Table of Contents

01 Global Trends in AI Standardization

02 China's AI Standardization Efforts

03 Next Steps

01 Global Trends in AI Standardization

1. Governments Worldwide Stepping Up Efforts to Advance the AI Industry

Global AI Focus Shifts from Safety Regulation to AI Innovation and Development

➢ **Standardization direction: Expanding from AI to GPAI**

- Standardization targets evolve from terminology and AI system frameworks to synthetic data, natural language processing, and risk management of generative AI systems.
- SC42 continuously establishes new working groups with relevant IT technologies and vertical sectors to develop AI standards, such as AI in healthcare and AI in finance.

➢ **Standardization targets shift from organization-oriented to product-oriented**

- Standardization targets expand from AI management systems to software and system quality, AI system methods and capabilities, functional safety, system accuracy, and AI testing.

➢ **Standardization targets shift from trustworthiness to product and service quality**

- IECEE will establish a task force on "Conformity Assessment and Certification for AI & Digital Transformation" to assess the impact of AI and digital transformation on the IECEE certification system.

2025 Paris Summit:
Statement on Inclusive and Sustainable Artificial Intelligence for People and the Planet , with the main tone shifting from safety to AI innovation and development.

International Trend: From AI to GPAI, from Organization-Oriented to Product-Oriented, from Trustworthiness to Emphasizing Technical Quality Characteristics

➢ **Policy-wise, the approach emphasizes industry self regulation, assumes technology is beneficial by default, and advocates for stringent regulation only after risks are proven**

- Trump 2.0: Emphasizes AI national sovereignty, deregulation, and economic independence; announces the Stargate project to build national AI infrastructure.

➢ **In terms of standardization, to counter Trump 2.0, the U.S. industry's standardization priorities remain focused on safety and governance, including:**

- Developing domestic standards covering transparency, bias, and data privacy to boost consumer confidence.
- Strengthening government-academia-industry partnerships to collaboratively develop standards.
- Increasing investment in international AI standards, enhancing ally/regional cooperation, aligning with global standards, and maintaining competitiveness in the global market.
- Enhancing AI security risk assessment practices (evaluation, tools).
- Strengthening standard alliances and cooperation between companies and institutions (e.g., NIST) in compliance and governance standards.

- Criticizes Europe's excessive regulation that hinders AI innovation
- U.S. and UK refuse to sign the AI Action Summit Declaration
- Emphasizes U.S. leadership in AI, implicitly criticizing China

Vance: Key Points from the Speech at the AI Action Summit

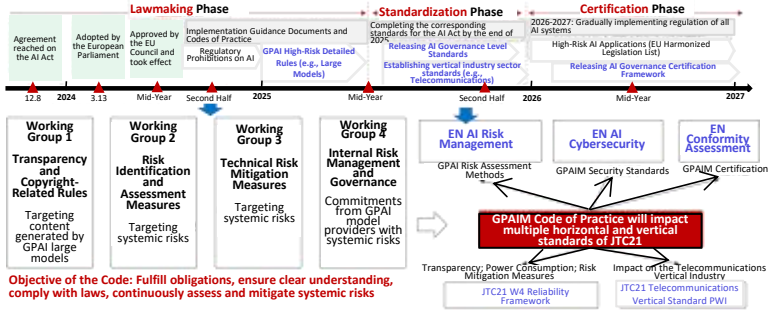
United States: Further Strengthening the Strategy of Light Regulation and Promoting Development

➢ **Policy-wise, there is reflection on excessive regulation. Investment in AI are accelerated.**

- With the AI Act already creating a "Brussels effect", the EU is shifting its focus to technological innovation and competitiveness.
- 60 European companies (including Airbus, Siemens, Mercedes-Benz, etc.) have signed the EU AI Champions Initiative, launched by a U.S. venture capital firm.
- In 2025, the EU launched InvestAI, mobilizing 200 billion euros to promote Europe as an AI continent.

➢ **In terms of standardization, regulatory requirements for GenAI will first be issued in the form of CoP, with formal GPAI guidelines to be released in 2025:**

- Clarifying the code of conduct for LLM operators in the EU market to mitigate systemic risks.
- Issuing a standardization request to CEN/CLC for GPAI LLM guidelines.
- This will impact multiple horizontal standards under JTC21 and vertical industry standards (such as telecommunications).



European Union: Considering "Easing" AI Regulation to Accelerate Investment in the AI Sector

2. Unprecedented Heat in Industrial Development

Global tech companies are actively advancing artificial intelligence, with the industry scaling up rapidly

Macro Perspective

- According to the latest 2025 report from the United Nations Conference on Trade and Development, the global AI market is projected to soar from $189 billion in 2023 to $4.8 trillion by 2033, representing a 25-fold increase over a decade.
- China has established a comprehensive industrial system covering the foundational layer, framework layer, model layer, and application layer. Its computing scale ranks among the top globally, and it has nurtured a group of highly competitive general-purpose and industry-specific LLMs. **Over the next decade, China will demonstrate significant growth trends and occupy an important position in the global market.**

Local Perspective

Application Layer	➢ Primarily refers to the application of AI technology in various industry scenarios. ➢ As of June 2025, 401 generative LLMs have been registered with the Cyberspace Administration of China, with industry-specific LLMs accounting for over 70%.
Model Layer	➢ Mainly includes LLM technologies and products, such as OpenAI GPT-4o, Baidu ERNIE Bot, and Huawei Pangu. ➢ Leading LLM company OpenAI completed a $66 billion financing round, setting a Silicon Valley record and becoming a $157 billion unicorn.
Framework Layer	➢ Primarily refers to deep learning frameworks and tools used for model development, such as PyTorch and PaddlePaddle. ➢ Baidu's PaddlePaddle ERNIE Bot has attracted over 21.85 million developers, served more than 670,000 enterprises, and created 1.1 million models.
Foundational Layer	➢ Mainly encompasses computing power, algorithms, and data. Computing power includes intelligent chips, computing clusters, and other intelligent computing products. ➢ NVIDIA, the world's largest supplier of intelligent chips and intelligent computing solutions, has seen its market capitalization exceed $3 trillion, ranking first globally.

3. Global AI Standardization Strategic Layout

Standardization Strategy	Standardization Tactics
 ◆ Light regulation and promotion of development ◆ Consolidating its global leading position	**1. Policy Impetus** Released the *National Artificial Intelligence Research and Development Strategic Plan*, *Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence*, *U.S. Government National Standards Strategy for Critical And Emerging Technologies (USG NSSCET): Implementation Roadmap*, and *Recommendations for Increasing U.S. Participation and Leadership in Standards Development.* **2. De Facto Standards Formation** Leading U.S. companies have established a series of **de facto standards (NVLink, CUDA, ONNX, MCP, etc.)**, which can be converted into international standards through the PAS process by relevant associations. **3. Dominance in Standardization Organizations** Holds chair and manager positions in ISO/IEC JTC 1/SC 42, with **8 international proposals** and **over 400 registered experts.**
 The "Brussels Effect", reshaping global governance rules	**1. Policy Impetus** • Released policy documents such as the *AI Act and Ethics Guidelines for Trustworthy AI*. • The EU appointed CEN/CENELEC JTC21 to develop 10 harmonized standards on risk management, data quality, transparency, robustness, etc., to implement the AI Act. **2. Dominance in Standardization Organizations** • Holds convenor positions in ISO/IEC JTC 1/SC 42/WG3 on Trustworthiness and JWG5 on NLP and LLM, **with 31 international proposals and over 300 registered experts.** • **CEN/CENELEC JTC21 established liaison with ISO/IEC JTC1 and formed joint working groups. T**hrough the Vienna Agreement, EU standards are converted into international standards.
 ◆ Promoting industrial security and development ◆ **Gain the right to shape the international discourse**	**1. Policy Impetus** • Released the *National Standardization Development Outline*, *Guidelines for the Establishment of the National Comprehensive Standardization System for the Artificial Intelligence Industry (2024 Version)*, *New Industry Standardization Pilot Project Implementation Plan*, and *Global Artificial Intelligence Governance Initiative.* • Established an international AI standardization innovation team focused on generative AI governance and LLMs. **2. Full-Chain Standardization Layout** • Considers a full-chain standardization framework encompassing international, national, industrial, and local levels. **3. Dominance in Standardization Organizations** • Holds the convenor position of ISO/IEC JTC 1/SC 42/WG5 on Computational approaches and computational characteristics of AI systems, with **9 international proposals and over 100 registered experts.**

4. Global AI Standardization Trends and Challenges

Challenges: 1. Broad Scope: There is an urgent need for standards addressing ethics and safety. 2. Long Chain: AI involves hardware, software, data, model algorithms, and industry applications, among other aspects. 3. Rapid Iteration: Continuous emergence of LLMs, intelligent computing centers, agent, etc. 4. Wide Application: AI is applied in science, healthcare, automotive, and other fields. Trend: Basic standards are evolving consistently, with framework compatibility and progressive development.

Evolution of ISO Management System Standards for AI

ISMS

27001 *Information Security Management System*
This standard specifies requirements for establishing, implementing, maintaining, and continuously improving an information security management system. It ensures the confidentiality, integrity, and availability of information through risk management processes.

PIMS

27701 *Privacy Information Management*
This standard is an extension to 27001 by providing additional requirements for privacy protection and offering extra guidance for controllers and processors of personally identifiable information.

AIMS

42001 *Artificial Intelligence Management System*
Building on 27001, this standard specifies requirements for establishing, implementing, maintaining, and continuously improving an AI management system, providing a certifiable framework.

Evolution of NIST Risk Management Framework for AI

CSF

NIST Cybersecurity Framework
Implements "Executive Order 13636 - Improving Critical Infrastructure Cybersecurity" (EO 13636). CSF 1.0 was released in 2014;
CSF 2.0 was released in 2024, helping organizations of all sizes and sectors manage and reduce cybersecurity risks.

Privacy Framework

NIST Privacy Framework
Implements "Improving Critical Infrastructure Cybersecurity" (EO 13636). This standard helps organizations of all sizes enhance privacy protection through risk management and is applicable to any technology, industry, law, or jurisdiction.

AI RMF

NIST AI Risk Management Framework (NIST AI 100-1)
Implements "Executive Order 14110 - Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence" (EO 14110). It proposes a structured approach to AI risk, outlines characteristics of trustworthy AI systems, and details four core functions: Governance, Mapping, Measurement, and Management.

NIST AI 600-1

AI RMF: Generative AI Profile
Extending AI RMF's four core functions, this standard helps identify unique risks of generative AI and proposes measures to mitigate them.

Evolution of China's Maturity Model Management Standards for AI

DCMM

GB/T 36073-2018
Data Management Capability Maturity Assessment Model
This standard provides a data management capability maturity assessment model with related maturity levels and defines eight capability domains: strategy, governance, architecture, application, security, quality, standards, and lifecycle.

DSMM

GB/T 37988-2019
Data Security Capability Maturity Model
This standard provides a maturity model framework for organizational data security capabilities, specifying requirements for data collection, transmission, storage, processing, exchange, destruction, and general security.

AIMM

Artificial Intelligence Management Capability Maturity Model
Combining the PDCA concept, this standard addresses the entire AI-enabled application process, defining AIMM capability domains from six dimensions: strategy, governance, resources, AI system lifecycle (development), application, and security trustworthiness.

5. Insights into International/Association Standardization of AI

International Organization for Standardization (ISO)

International Electrotechnical Commission (IEC)

ISO/IEC JTC1/SC42

Major Participating Countries:

◆U.S., Germany, France, U.K., Canada, Japan, South Korea, India, and 72 member states (48 P-members, 24 O-members)

Focus Areas:

◆ Addressing dynamic AI technical/non-technical requirements with an ecosystem approach, focusing on AI data quality, governance, trustworthiness, safety, and societal issues.

Standardization Status

◆81 international standards (U.S. led 8; EU led 31; China led 9)

Key Standards:

◆ISO/IEC 42001 AI Management System

◆ISO/IEC 23894 AI - Guidance on Risk Management

◆ISO/IEC 5259 Data Quality Series

◆ISO/IEC 25568 Guidance on Addressing Risks in Generative AI Systems

International Telecommunication Union (ITU)

ITU-T SG21/Q5 AI-Enabled Multimedia Applications

Major Participating Countries:

◆China, Japan, South Korea, Brazil (leading roles)

Focus Areas:

◆Developing standards for AI-enabled multimedia applications, including algorithms and data structures

Standardization Status

◆100 international standards (China led 96; South Korea led 3; Brazil led 1)

Key Standards:

◆F748.38 Technical Specification for Artificial Intelligence Cloud Platform: General Architecture

◆F748.46 Requirements and Evaluation Methods of Artificial Intelligence Agents Based on Large Scale Pre-Trained Models

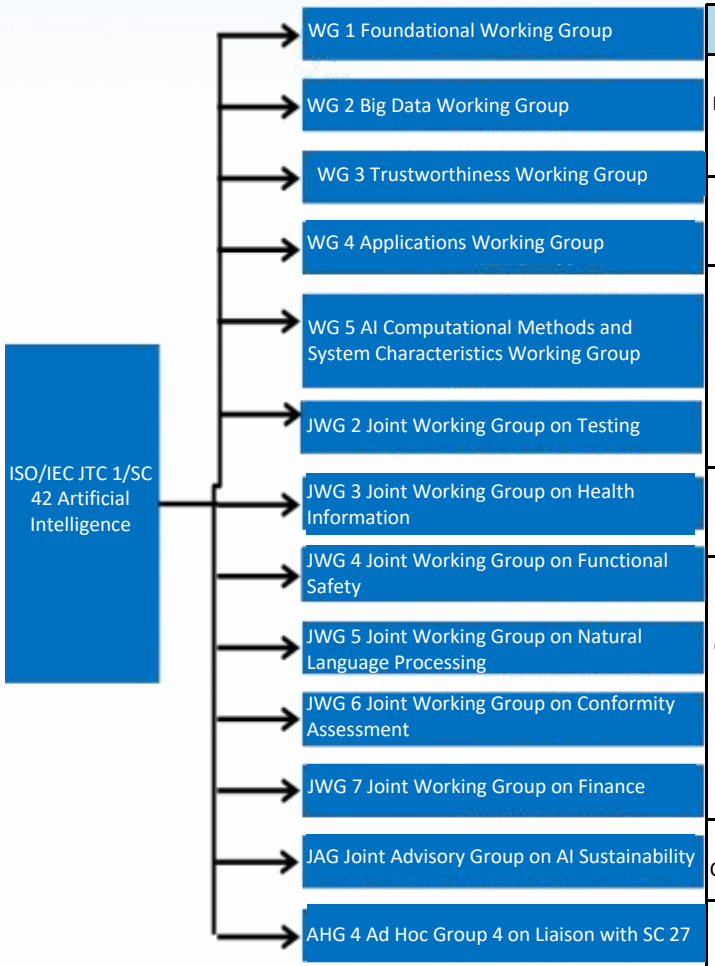
◆F 746.15 Requirements for Smart Broadband Network Gateway in Multimedia Content Transmission

◆F 748.43 Framework and Requirements for a Foundation Model Platform

6. Chinese Participation in International AI Standardization

ISO/IEC JTC1/SC42 Standard Development Strategy: Addressing dynamic AI technical/non-technical requirements with a holistic ecosystem approach, focusing on AI data quality, governance, trustworthiness, safety, and societal issues.

- China has registered **over 100 experts**, participating in all **5 working groups**, **4 joint working groups**, and **2 liaison groups** of ISO/IEC JTC1/SC42.
- Experts from the China Electronics Standardization Institute (CESI) hold convenor and secretary positions in ISO/IEC JTC1/SC42/WG5.
- **China is leading 9 international standards, with 6 published and 3 under development.**



Working Group	Working Content
WG 1 Foundational Working Group	ISO/IEC 42001: 2024 *Information Technology - Artificial Intelligence - Management System* ISO/IEC DIS 42005 *Information Technology - Artificial Intelligence (AI) - AI System Impact Assessment* ISO/IEC DIS 42006 *Requirements for Bodies Providing Audit and Certification of Artificial Intelligence Management Systems*
WG 2 Big Data Working Group	ISO/IEC 5259-4: 2024 Artificial Intelligence - Data Quality for Analytics and Machine Learning (ML) - Part 4: Data Quality Process Framework
WG 3 Trustworthiness Working Group	ISO/IEC TS 8200: 2024 *Information Technology - Artificial Intelligence - Controllability of Automated Artificial Intelligence Systems* ISO/IEC DIS 12792 *Information Technology - Artificial Intelligence - Transparency Taxonomy of AI Systems* ISO/IEC 23894: 2023 *Information Technology - Artificial Intelligence - Guidance on Risk Management* ISO/IEC TR 24028:2020 *Information Technology - Artificial Intelligence - Overview of Trustworthiness in Artificial Intelligence* ISO/IEC TS *Information Technology - Artificial Intelligence - Guidance on Addressing Risks in Generative AI Systems*
WG 4 Use Cases and Applications Working Group	ISO/IEC 5338: 2023 *Information Technology - Artificial Intelligence - AI System Life Cycle Processes* ISO/IEC TR 24030: 2024 *Information Technology - Artificial Intelligence (AI) - Use Cases*
WG 5 Computational Methods and AI System Characteristics Working Group	ISO/IEC TS 4213: 2022 *Information Technology - Artificial Intelligence - Assessment of Machine Learning Classification Performance* ISO/IEC AWI 4213 *Information Technology - Artificial Intelligence - Performance Measurement for AI Classification, Regression, Clustering and Recommendation Tasks* ISO/IEC 5392: 2024 *Information Technology - Artificial Intelligence - Reference Architecture of Knowledge Engineering* ISO/IEC TR 17903: 2024 *Information Technology - Artificial Intelligence - Overview of Machine Learning Computing Devices* ISO/IEC TR 24372: 2021 *Information Technology - Artificial Intelligence (AI) - Overview of Computational Approaches for AI Systems* ISO/IEC TS 42112 *Information Technology - Artificial Intelligence - Guidance on Machine Learning Model Training Efficiency Optimization*
JWG 6 Joint Working Group on Conformity Assessment for AI Systems	ISO/IEC 42007 *Information Technology - Artificial Intelligence - High-level Framework and Guidance for the Development of Conformity Assessment Schemes for AI Systems*
JWG5 Natural Language Processing	ISO/IEC NP 25623 *Artificial Intelligence - Machine Learning (ML) Model Description Framework*

02 China's AI Standardization Efforts

1. Comprehensive Standardization Layout for the Entire AI Industry Chain

中国电子技术标准化研究院
China Electronics Standardization Institute

Security/Governance

Smart Products and Services

Smart Robots | Smart Terminals | Smart Transport Vehicles | Digital Human | Smart Services

Industry Applications Empowering New Industrialization

R&D and Design | Pilot Verification | Production/Manufacturing | Marketing Services | Operations Management | Scientific Intelligence Computing | Smart Energy | Smart Logistics | Smart Transportation | Smart Government | Smart Building Agriculture | Smart

Key Technologies

General Technologies: Machine Learning | Deep Learning | Reinforcement Learning | Self-Supervised Learning

Domain-Relevant Technologies: Computer Vision | Smart Voice | Natural Language Processing

LLM: VLM | LLM | Speech LLM | Multimodal Large Model

Agent: Conversational Service Agent | Workflow Arrangement Agent | Autonomous Agent

Embodied AI: Industry-Specific Embodied AI | Service-Specific Embodied AI | Special Embodied AI

Basic Software

System Software: Compiler | Runtime | Operator Library | Communication Library | Migration & Tuning Tool | Inference Engine

Deep Learning Framework: Tensorflow | Pytorch | Mindspore | PaddlePaddle

Data: Data Acquisition | Data Cleaning | Data Processing | Data Operation

Basic Hardware

Materials: Manufacturing Materials | Packaging Materials

Intelligent Chip: GPGPU | FPGA | ASIC

Intelligent Computing Device: AI Accelerating Module | AI Server

Intelligent Computing Center: Large Scale Computing Cluster | Integrated Big Data Center | Supercomputing Center

- In terms of safety and governance, TC28 conducts standardization work on AI trustworthiness and management. TC260 conducts standardization work on generative AI security and content identification.
- In terms of industry applications, TC28 conducts standardization work on industry-specific LLMs and intelligent assessment of industrial production processes. TC28 collaborates with TC42, TC180, TC183, TC221, TC355, and TC426 to develop "AI+" standards.
- In terms of key technologies, TC28 and MIIT/TC1 conduct standardization work on machine learning, computer vision, and intelligent speech, pre-research and development of standards for cutting-edge technologies such as multimodal LLMs, embodied AI, and agent, and pre-research on standards for agent interconnection protocols.
- In terms of basic software, TC28 conducts standardization work on unified communication libraries, compiler interfaces, and inference engines.
- In terms of software-hardware adaptation, TC28 conducts standardization work on north-south compatibility **to address the ecosystem monopoly of "NVIDIA + TensorFlow/PyTorch"**.
- Data-wise, TC609 conducts standardization work on the classification and evaluation of high-quality datasets, as well as training data formats.
- In terms of basic hardware, **TC203 conducts standardization work on semiconductor materials in the chip field. TC599 conducts standardization work on chip performance requirements and evaluation methods. TC28 conducts standardization work on inter-card connectivity, heterogeneous chip clusters, super nodes, and intelligent computing centers.**

International Standardization Organizations: ISO/IEC JTC 1/SC 27, ISO/IEC JTC 1/SC 42, ITU-T SG21, IEC/TC47/SC47A (International Electrotechnical Committee Subcommittee on Integrated Circuits), SC47D (Subcommittee on Semiconductor Device Packaging)
Domestic Standardization Organizations: TC28 (National Technical Committee 28 on Information Technology), TC260 (National Technical Committee 260 on Cybersecurity), TC42 (National Technical Committee 42 on Coal), TC180 (National Technical Committee 180 on Finance), TC183 (National Technical Committee 183 on Steel), TC203 (National Technical Committee 203 on Semiconductor Equipment and Materials), TC221 (National Technical Committee 221 on Medical Devices), TC268 (National Technical Committee 268 on Intelligent Transportation), TC355 (National Technical Committee 355 on Oil and Gas), TC591 (National Technical Committee 591 on Robotics), TC599 (National Technical Committee 599 on Integrated Circuits), TC609 (National Technical Committee 609 on Data), MIIT/TC1 (Artificial Intelligence Standardization Technical Committee of the Ministry of Industry and Information Technology)

2. Domestic (Chinese) AI Standardization Organizations

National Artificial Intelligence Standardization General Working Group

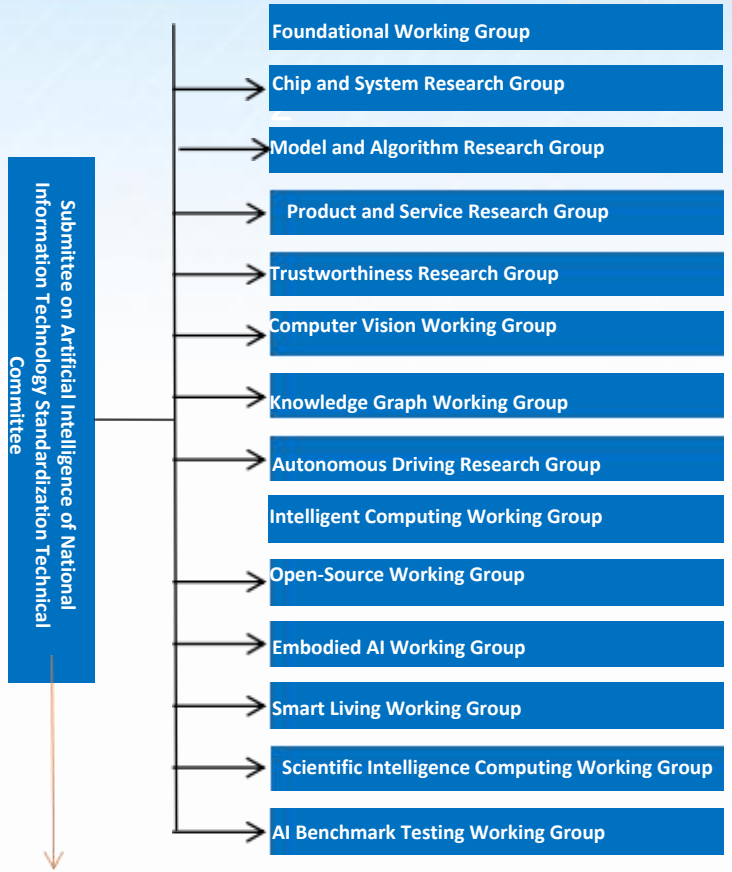
Responsible for coordinating AI standardization efforts, **formulating China's AI standardization plans, systems, and policy measures, and harmonizing the technical content and oversight of AI-related national standards.**

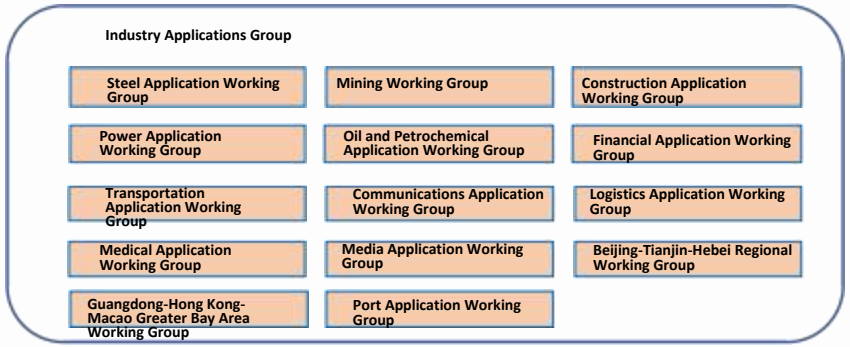
Submittee on Artificial Intelligence of National Information Technology Standardization Technical Committee

On March 18, 2020, the National Standardization Administration approved the establishment of the Submittee on Artificial Intelligence of National Information Technology Standardization Technical Committee. It primarily oversees the formulation and revision of national standards in AI foundations, technologies, risk management, trustworthiness, governance, products, and applications. It corresponds internationally to ISO/IEC JTC 1/SC 42.

Artificial Intelligence Standardization Technical Committee of the Ministry of Industry and Information Technology

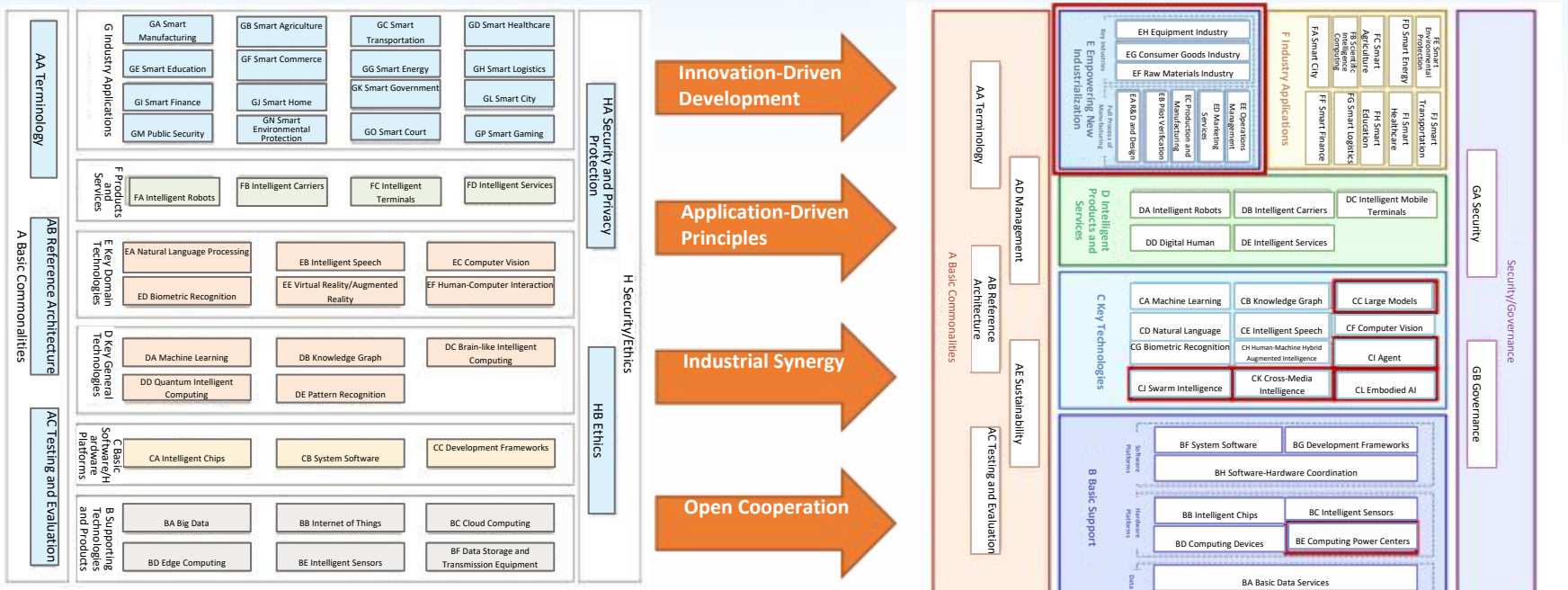
Serves as the vice-chair unit of the AI Industry Standardization Technical Committee.





3. Top-Level Design of AI Standards

In 2024, MIIT and three other ministries jointly issued *the* ***Guidelines for*** **the Construction of a** ***Comprehensive Standardization System for the National Artificial Intelligence Industry*** *(2024 Version)*



Guidelines for the Construction of a National New Generation Artificial Intelligence Standards System **(2020)**

Guidelines for the Construction of a Comprehensive Standardization System for the National Artificial Intelligence Industry (2024 Version)

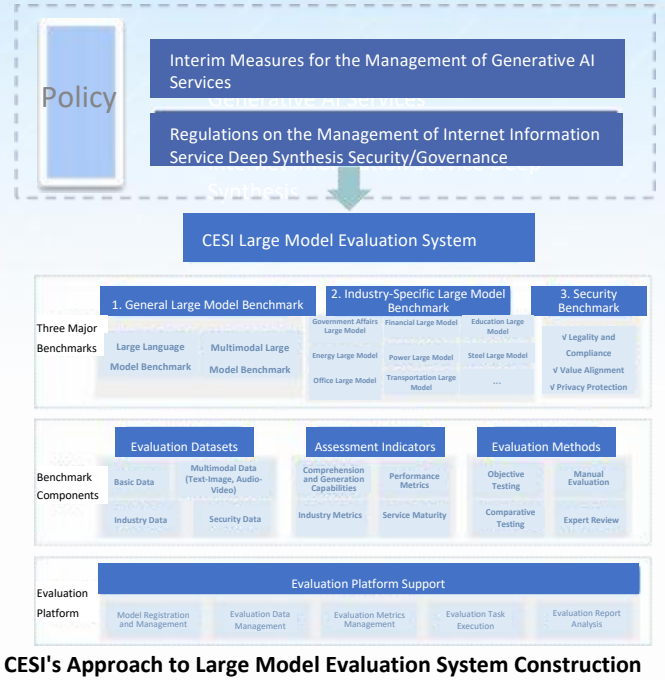
- **Key Roles of the *Guidelines*:** Unite powerful synergies for industrial development, accelerate intelligent transformation and upgrading of industries, regulate foundational order of industrial development, and promote global international exchanges and cooperation.
- **Construction Goals of the *Guidelines*:** By 2026, enhance the linkage between standards and industrial technological innovation, **develop over 50 new national and sector standards**, and accelerate the formation of a standard system that leads high-quality development of the AI industry. **Promote standards in over 1,000 enterprises, with more pronounced results in supporting enterprise innovation and development. Participate in the formulation of over 20 international standards to promote the globalization of the AI industry.**

中国电子技术标准化研究院
China Electronics Standardization Institute

5. Key Focus: Large Model Evaluation Benchmark

LM Bench Large Model Benchmark-Related Standards List

Standard No.	Standard Name
General Large Models	• GB/T 45288.1-2025 Artificial Intelligence - Large-Scale Model - Part 1: General Requirements • GB/T 45288.2-2025 Artificial Intelligence - Large-Scale Model - Part 2: Testing and Evaluation for Metrics and Methods • GB/T 45288.3-2025 Artificial Intelligence - Large-Scale Model - Part 3: Service Capability Maturity Assessment • Artificial Intelligence - Large-Scale Model - Part 4: Large-Scale Model of Computer Vision • Artificial Intelligence - Large-Scale Model - Part 5: Multimodal Large Model • 20252036-Z-469 Artificial Intelligence - Large-Scale Model - Part 6: Code Large Language Model • 20252037-Z-469 Artificial Intelligence - Large-Scale Model - Part 7: Speech Large-Scale Model • 20252038-Z-469 Artificial intelligence - Large Model Selection and Application Guide • 2024-1339T-SJ Artificial Intelligence Key Technologies - Specification for Terminal-Cloud Device Model Collaboration Systems • 20252039-Z-469 Artificial Intelligence - Large Language Model Alignment Capability Evaluation • 20254289-Z-469 Artificial Intelligence - Technical Specification for On-Device Large Model Engines
Industry-Specific Large Models	• 20252048-Z-469 Artificial Intelligence - Technical Requirements of Industrial Foundation Models • 20252050-Z-469 Artificial Intelligence - System Architecture of Industrial Foundation Model • 20252059-Z-469 Artificial Intelligence - Technical Requirements for Machine Learning System • 20252060-Z-469 Artificail Intelligence - Technical Requirements for Large Scale Model of Home Scene • 20252062-Z-469 Artificial Intelligence - Technical Requirements for Large-Scale Model System of Electric Power • 20252063-Z-469 Artificial Intelligence - Evaluation Metrics and Methods for Large Models of Electric Power Industry • 20252065-Z-469 Artificial Intelligence - Large Model Evaluation Metrics and Methods for Petroleum and Petrochemical Industry • 20252070-Z-469 Artificial Intelligence - Maturity Assessment of Service Capabilities for Iron and Steel Large Model • 20252069-Z-469 Artificial Intelligence - Technical Requirements for Datasets Used in Large Model of Steel Industry • 20252068-Z-469 Artificial Intelligence - Classification Guide for Application Scenarios of Iron & Steel Industry • 20252071-Z-469 Artifical Intelligence - Technical Requirements for Large Port Model • 20252078-Z-469 Artificial Intelligence - Technical Requirements for Large Scale Model of Construction Industry • 20252079-Z-469 Artificial Intelligence - Road Traffic Large Model General Requirements for System Service Capability • 20252080-Z-469 Artificial Intelligence - Technical Requirements for Office Large Model System



CESI's Approach to Large Model Evaluation System Construction

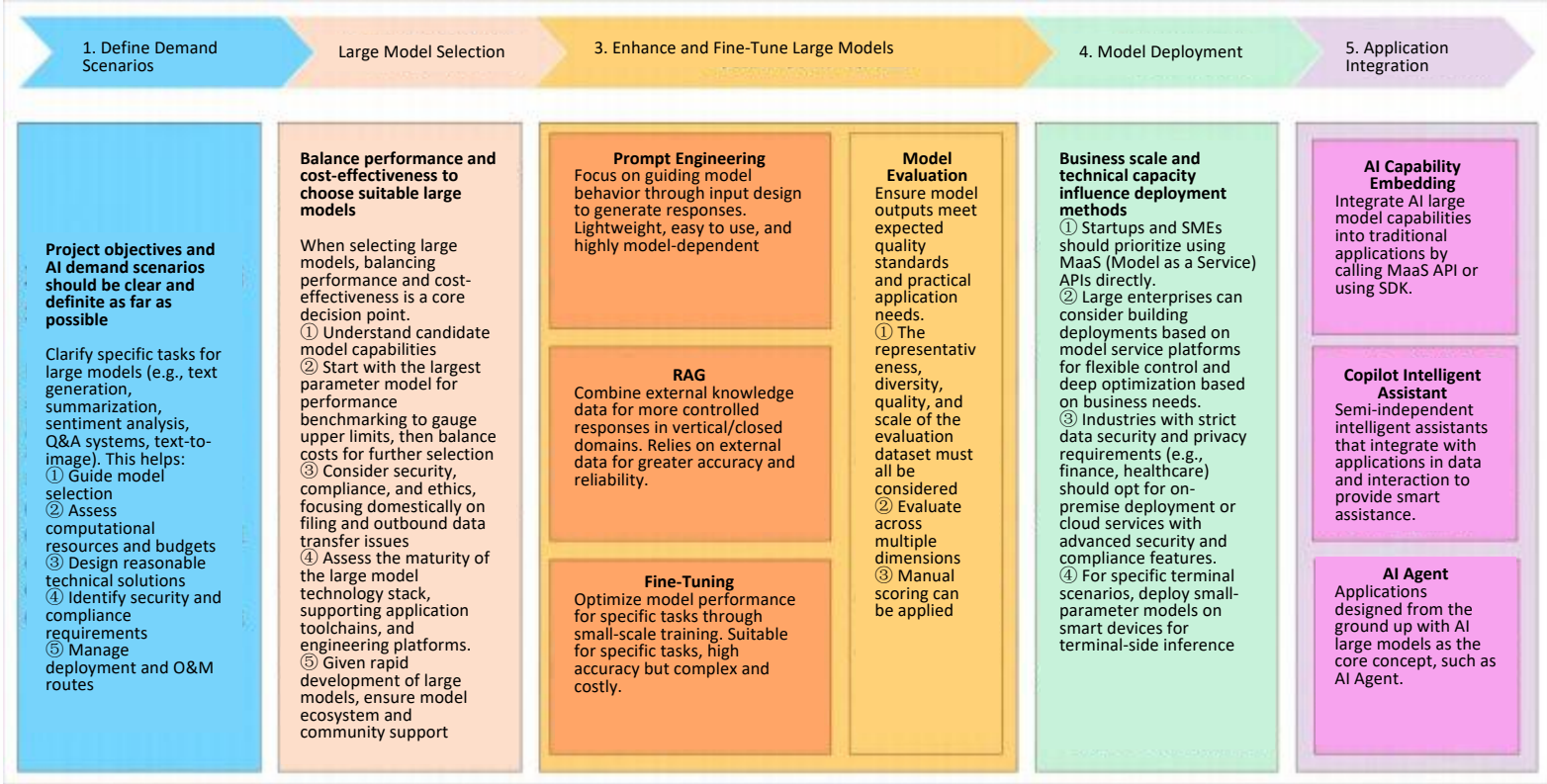
- The China Electronics Standardization Institute (CESI) has developed the LMBench evaluation benchmark and corresponding testing tools to form a comprehensive large model evaluation system;
- **Supports the evaluation of large models for state-owned enterprises.** Evaluations have been conducted for 10 entities, including Alibaba, Inspur, Baidu, Zhipu, and China Mobile, focusing on large language models, **resulting in a general whitelist of large model.**
- Evaluations are ongoing for large models in power, petroleum, logistics, and transportation industries; Conducts selection of base large models (language, vision, multimodal) for central state-owned enterprises such as Sinopec, State Grid, and China Southern Power Grid;
- Promotes LMBench as a critical reference for base large model selection and the implementation of industry-specific large models.

5. Key Focus: Large Model Selection and Application Guidelines

Develop **20252038-Z-469 *Artificial intelligence - Large Model Selection and Application Guide*** to standardize AI selection and application centered on large models. Currently, the national guiding technical document has been approved. The standard aims to promote deep integration of AI with all elements, processes, and chains of manufacturing, addressing industrial upgrade bottlenecks and shaping international competitive advantages.

Existing Challenges

- **Lack of Technical Understanding**: Low adoption rate among manufacturing enterprises, majority lacks of interdisciplinary talent.
- **Lack of Application Capabilities:** Significant obstacles in scenario deconstruction, technology selection, and system integration; low standardization of AI products.
- **Weak Infrastructure:** High proportion of "dumb devices", limited data collection and processing capabilities, and technical foundations insufficient to support large-scale AI deployment.
- **Shortcomings in Public Services:** Inefficient collaborative innovation mechanisms across the industrial chain, lagging standard systems and infrastructure construction.



Enterprise Large Model Construction Flowchart

5. Key Focus: Agent Protocols

Focused on a full-chain layout of "technology-standards-sector-international", building a domestic agent protocol standards system to ensure industrial safety and controllability. By breaking through core technologies, leading standards systems, and expanding the global ecosystem, achieving leapfrog development from following to leading in the agent industry.

MCP

Core Features:

- Individual agent provides tools and data access to “context interface”
- Offers a unified interface for agents to invoke external resources and tools.
- Components: MCP Host, MCP Server

Application Scenarios:

- Primarily used for single-agent tool invocation, solving interaction issues between agents and the external world.
- Communication between agents and MCP servers (acting as tool and data proxies).
- Supports remote and local operation

Openness:

- Introduced by Anthropic as part of its ecosystem; other companies have limited open-source influence.
- Further intensifies ecosystem competition, with all internet services (APIs) actively or passively adopting MCP.

A2A

Core Features:

- Direct communication and collaboration between different agents.
- Enables agents from different sources and technologies to communicate, securely exchange information, and collaboratively execute complex tasks
- Agent capability description and discovery: AgentCard, Task, Artifact, Message, Part.

Application Scenarios:

- Suitable for multi-agent systems, addressing interoperability challenges between agents.
- Direct communication between agents, supporting asynchronous and stateful interactions.
- Supports only remote operations

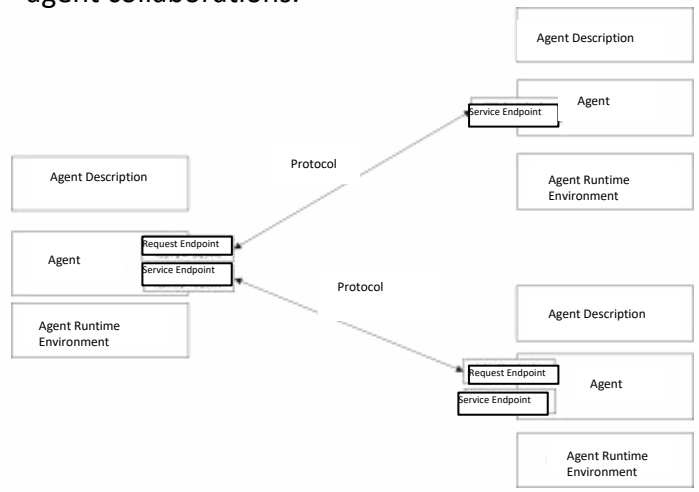
Openness:

- Google and Microsoft
- **Google donated A2A to the Linux Foundation, aiming to make it an open standard**

General Framework Standard for Agent Interconnection

Core Features:

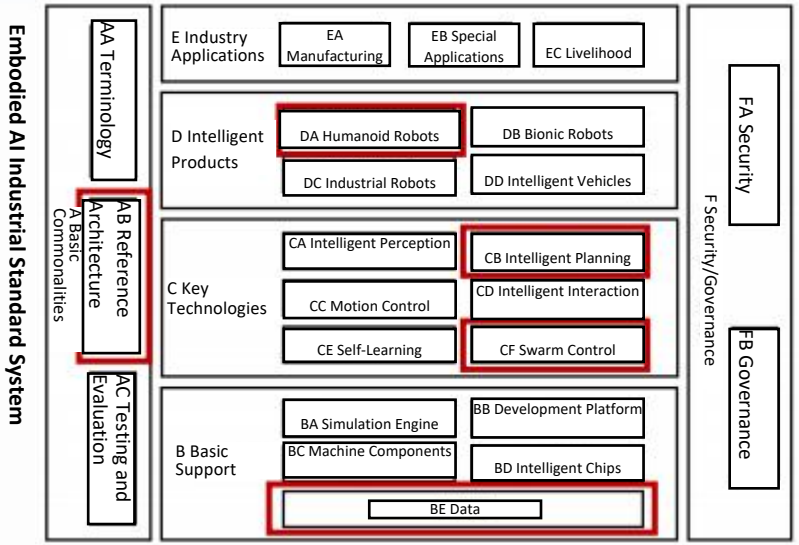
- Focuses on the architectural level, providing top-level guidance for technical implementation and promoting efficient interconnection between different agents.
- Builds a unified and efficient interconnection system around key elements such as interfaces, processes, and identifier resolution, providing solid support for agent collaborations.



Reference Topology Architecture for AI Agent Interconnection and Collaboration

5. Key Focus: Embodied AI

- Addresses challenges in the embodied AI industry chain, such as lack of technical standardization, poor interoperability, difficult market access, low public acceptance, and high costs. Conducts industrial research and standard requirement analysis, establishing an embodied AI industrial standards system.
- Clarifies standard lists of the urgent in short-term and the research in long-term based on current technological development and trends. Develops standards for embodied AI systems, embodied AI data, embodied large models, and embodied AI intelligence.



20252046-Z-469 *Artificial Intelligence - Technical Specification for Embodied Intelligentce System*

- Clarifies definitions related to embodied AI and proposes an embodied AI system framework from development and application perspectives.
- Proposes capability requirements and evaluation methods for embodied AI systems in perception, planning, action, interaction, and learning.
- Collaborates with enterprises such as the Institute of Automation Chinese Academy of Sciences, Beihang University, National and Local Jointly-built Embodied Intelligent Robot Innovation Center, and Ubtech to clarify the connotation and scope of embodied AI and promote industry consensus.

20252047-Z-469 *Artificial Intelligence - Specifications for Embodied Intelligence Data Quality*

- Proposes embodied AI data collection content, including configuration information, machine task data, and human motion capture data.
- Proposes data collection methods, clarifying collection requirements and security requirements.
- Collaborates with enterprises such as National and Local Jointly-built Embodied Intelligent Robot Innovation Center, AgiBot, Ubtech, and Peng Cheng Laboratory, which have established embodied AI datasets, to standardize embodied AI dataset formats and promote the formation of shareable, open-source datasets.

Simultaneous Pre-Research

- **Standards for synthetic data platforms**
- **Standards for data quality specifications**
- **Standards for embodied agents**
- **Standards for swarm intelligence collaborative control**
- **Standards for embodied AI trustworthiness**
- etc.
- Simultaneous application for national/sector standard projects that is still under research.

20252044-Z-469 *Artificial Intelligence - Technical Requirements for Embodied Large Model System*

- Proposes an embodied large model system architecture to guide large model developers in building embodied large model systems.
- Proposes functional and performance requirements for embodied large models, providing selection basis for large model users.
- Collaborates with enterprises such as Huawei Cloud, Baidu, and Xiaomi to standardize the reference architecture for embodied AI large models and guide industry development and use of embodied AI large models.

20252043-Z-469 *Artificial Intelligence - Intelligent Grading of Embodied Intelligence*

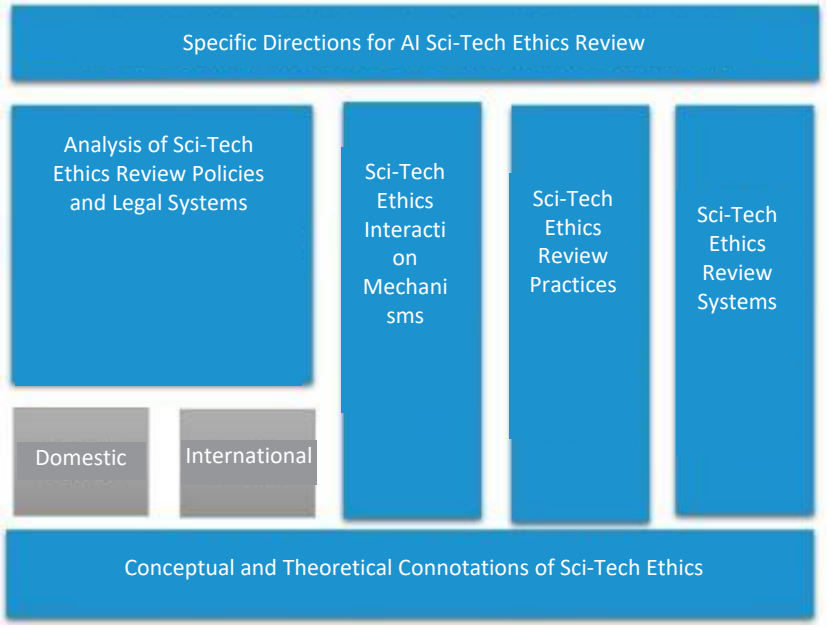
- Based on the capability requirements proposed in "*Artificial Intelligence - Technical Specification for Embodied AI Systems*", divides embodied AI intelligence into five levels. Proposes a maturity grading model and grading methods.
- Collaborates with enterprises such as Ubtech, Robot Era, Limx Dynamics, iFlytek, and Xiaomi to clarify intelligence requirements for humanoid robots and promote their intelligent development.

5. Key Focus: AI Security & Governance

Implementing the requirements of the ***Measures for Sci-Tech Ethics Review*** and the ***Measures for the Management of Ethical Services in Artificial Intelligence***, compiling and releasing the research report *Sci-Tech Ethics Review of Artificial Intelligence in the Intelligent Era*, and **developing 21 national standards for safety/governance**.

AI Sci-Tech Ethics Review in the Intelligent Era

- This report systematically outlines the philosophical foundations and five core principles of sci-tech ethics, providing a theoretical basis for the ethical principles (e.g., fairness and justice) in the *Measures*.
- Proposes eight key assessment points for AI ethical review, with detailed evaluation metrics (e.g., fairness, algorithm transparency), supporting the practical implementation of the *Measures*.



Eight Dimensions

- Human rights protection, sustainable development, cultural diversity, privacy protection, fairness and justice, system security, algorithm transparency, supervision and accountability.

Rules and Regulations

- **Domestically:** Establishes a three-tier system of "laws-policies-standards".
- **Internationally:** Compares the EU's strong regulation and the U.S.'s light regulation, proposing a "**categorized and tiered + collaborative governance**" solution.

Establishing a Governance System Guided by National AI Governance Standards

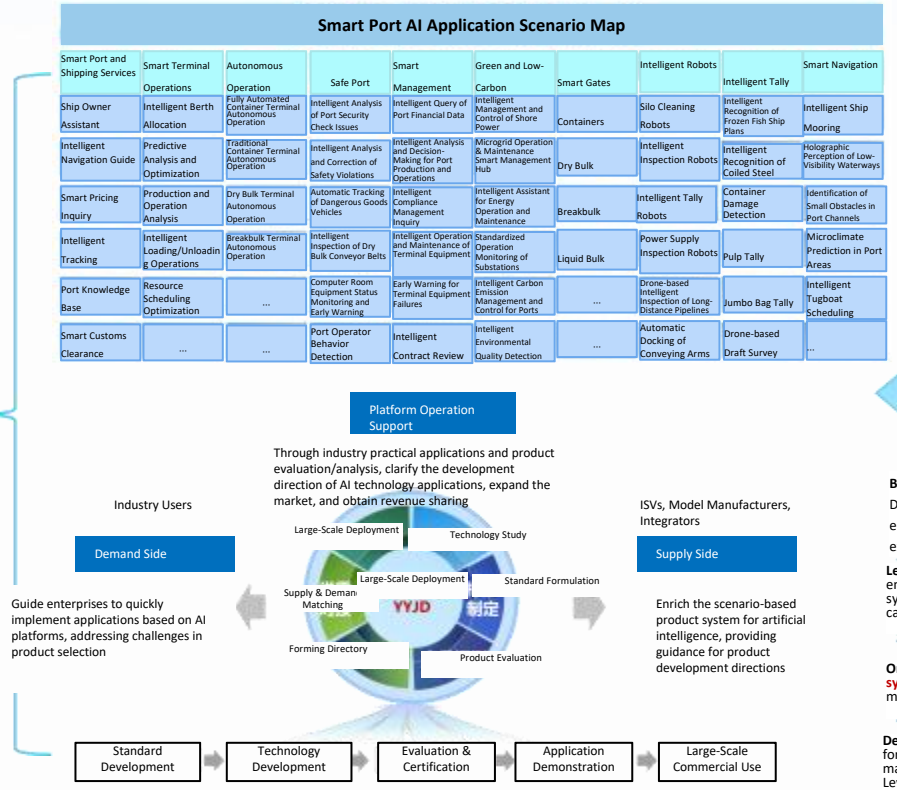
Standard No.	Standard Name
20240562-T-469	Artificial Intelligence - Trustworthiness - Part 1: General Rules
Technical Guidance Document	Artificial Intelligence - Trustworthy Datasets
20231169-T-469	Artificial Intelligence - Technical Specifications of Federated Learning
20231740-T-469	Artificial Intelligence - Risk Management Capability Assessment
Technical Guidance Document	Artificial Intelligence - Risk Management Guidelines for Generative AI Systems
Proposed	Proposed Management System for Sci-Tech Ethics (Review) Committees - Part 2: Artificial Intelligence
Proposed	Assessment Model for Intelligent Maturity of AI Enterprises
GB/T 45654-2025	Cybersecurity Technology - Basic Security Requirements for Generative Artificial Intelligence Service
GB/T 45674-2025	Cybersecurity Technology - Generative Artificial Intelligence Data annotation Security Specification
GB/T 45652-2025	Cybersecurity Technology - Security Specification for Generative Artificial Intelligence Pre-training and Fine-tuning Data
20230249-T-469	Cybersecurity Technology - Security Framework for Artificial Intelligence Computing Platform
Proposed	**Cybersecurity Technology - Security Classification and Grading Methods for AI Applications**
Proposed	**Cybersecurity Technology - Assessment Method for AI Security Capability Maturity**
Proposed	Cybersecurity Technology - Guidelines for AI Guardrail Construction
Proposed	Cybersecurity Technology - Interoperability Security Specifications for Generative AI Systems
Proposed	Cybersecurity Technology - Security Requirements for Mobile Internet-Oriented Agents
Proposed	Cybersecurity Technology - Cybersecurity Guidelines for Terminal-Side Large Models
Proposed	Cybersecurity Technology - Security Requirements for Embodied AI
Proposed	Cybersecurity Technology - Technical Implementation Guide for Detecting AI-Generated Content
Proposed	Cybersecurity Technology - Security Requirements for AI Training and Inference Frameworks
Technical Guidance Document	**Cybersecurity Technology - Security Guidelines for AI Applications Involving Minors**
ISO/IEC TR 24368	Information Technology - Artificial Intelligence - overview of Ethical and Societal Concerns
ISO/IEC CD TS22443	Information Technology - Artificial Intelligence - Guidance on Addressing Societal Concerns and Ethical Considerations

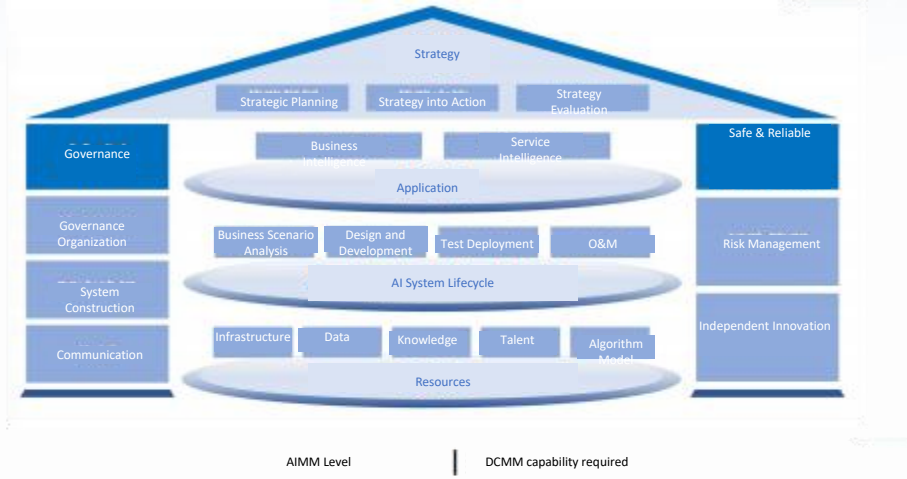
6. AI-Empowered Industry Standard Families

- **Focused on AI demonstration applications, industry base pilots, and training grounds, creating "showcase rooms" for industry implementation.**
- Targeting key areas such as **AI + steel, chemicals, power, finance, manufacturing, cultural tourism, scientific intelligence computing, and embodied AI**, building an AI-empowered industry application standards system + enterprise intelligent upgrade model, forming standards families to guide and standardize **full-scenario intelligent upgrades** in key industries through a combined approach.

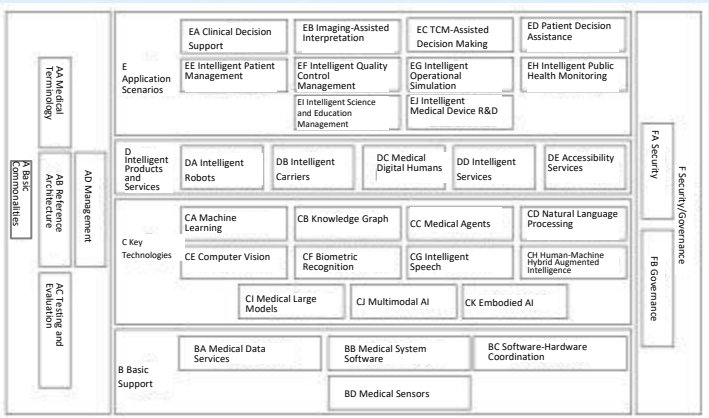
Standard Type	Standard Name
Platform Technology Standards	*AI-Enabled Port Technology Reference Architecture*
	Port Large Model System Technical Requirements
	Port AI Large Model Functional Test Indicator System
	Port AI Large Model Performance Test Indicator System
	Smart Port Construction Guide
Data Standard	*Smart Port Data Governance and O&M Requirements*
	Port Data Classification and Encoding Specifications
	Port Data Acquisitionand Transmission Technical Requirements
	Port Data Architecture Specifications
	Data Grading and Classification Specifications
	Large Model Port Industry Dataset Technical Specifications
	Smart Port Data Privacy and Protection Requirements
Key Technology Standards	*Port Intelligent Edge Device Technical Requirements*
Security Standards	*Smart Port Security Grading Protection Indicator System*
Application Scenario Standards	*Port Industry AI Scenario Map*
	Port Intelligent Transportation and Vehicle Dispatch Integrated Management System Technical Requirements
	Port Intelligent Carrier Decision and Control Technical Requirements
	Port Intelligent Service Platform Technical Requirements
	Port Smart Logistics Transportation Full-Process Technical Requirements
	Full-Element Intelligent Dispatch System Technical Requirements for Ports
	Full-Element Intelligent Dispatch Data Processing and Model Building Technical Requirements for Ports

List of Standards



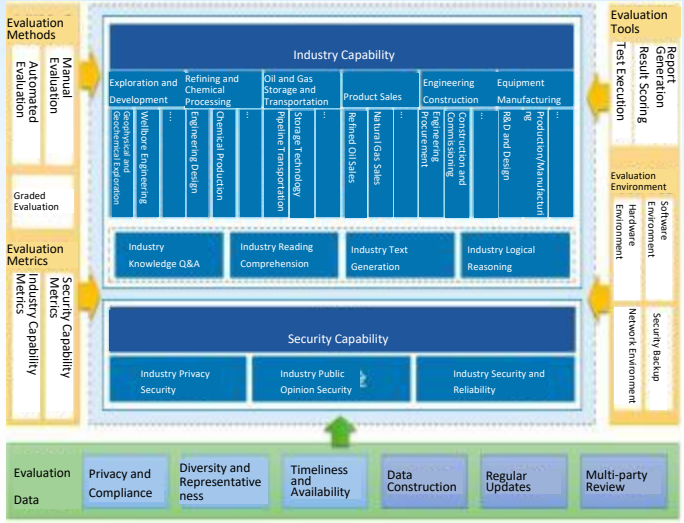


7. AI Empowering Key Industries



Medical Industry Artificial Intelligence Standard System Structure Diagram

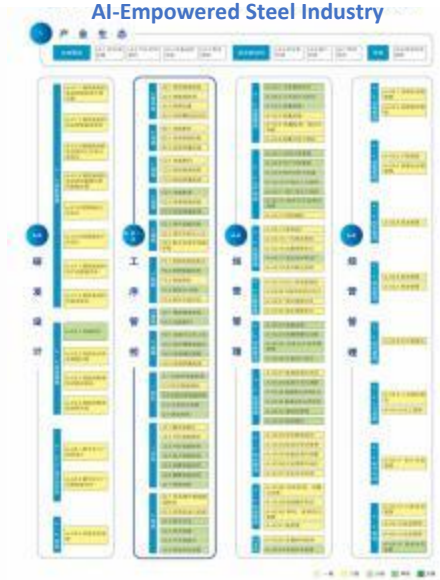
- Focusing on the standards layout of AI+healthcare in basic commonalities, basic support, key technologies, smart products and services, application scenarios, and safety/governance, collaborating with the National Health Commission and other units to develop and propose a medical industry artificial intelligence standard system.



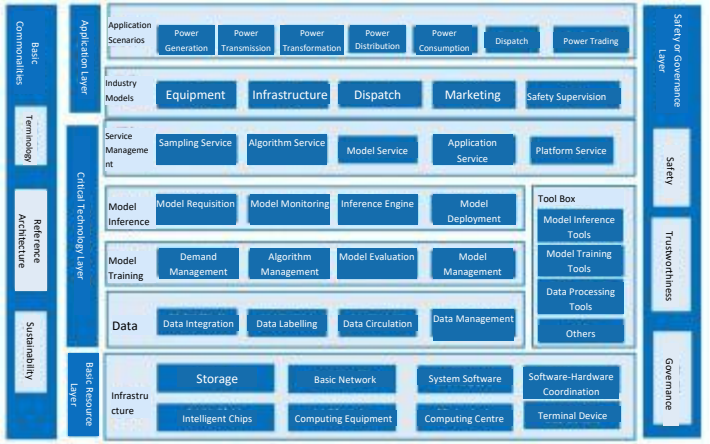
Petroleum and Petrochemical Large Model Evaluation Framework

- Forming AI industry applications in petroleum and petrochemical **exploration and development, refining and chemical processing, oil and gas storage and transportation, product sales, construction engineering , equipment manufacturing** and other fields;
- Collaborating with Sinopec, CNOOC and other units, focusing on sector-specific large model capabilities such as knowledge Q&A, text generation, and logical reasoning, to develop and propose an evaluation framework for large models in the petroleum and petrochemical sector.

Intelligent Grading Map for Typical Scenarios in AI-Empowered Steel Industry



- AI+steel is mainly applied in four typical business segments: R&D and design, operation management, business management, and process control, including scenarios such as raw materials, sintering, steelmaking, refining, hot rolling, cold rolling, storage, sales, and operational services;
- Collaborating with China Iron & Steel Research Institute, Baosteel, University of Science and Technology Beijing and other units to develop an intelligent grading map of typical scenarios where AI empowers the steel industry.



Power Industry AI Standard System StruCture Diagram

- Currently, AI technology has penetrated all seven business segments of the power industry chain: **power generation, transmission, transformation, distribution, consumption, dispatch, and power trading,** comprehensively covering mainstream business scenarios;
- Collaborating with State Grid, China Southern Power Grid, Huawei and other units to develop and propose a power industry artificial intelligence standards system and compile the *Research Report on AI-Enabled Power Industry Standardization*.

8. Promotion and Implementation of AI Standards

- Focusing on the integrated application needs of AI with key industries such as government affairs, healthcare, transportation, ports, energy, logistics, construction, smart homes, and agriculture, collaborating with industry standard committees including National Technical Committee 183 on Steel (TC183), National Technical Committee 591 on Robotics (TC591), National Technical Committee 180 on Finance (TC180) and large central state-owned enterprises to jointly sort out standard requirements, actively expand industry fields, strengthen the development of application standards such as industrial large models, steel large models, and steel industry application scenario guidelines, and leverage AI to empower new industrialization.

Soliciting National Standard Requirements in the Field of Artificial Intelligence

On January 3, 2025, **187 standard needs** were collected from all sectors of society regarding basic commonalities, basic support, key technologies, smart products and services, empowering new industrialization, industry applications, security/governance and other aspects.

Closed-Door Seminar on Important AI Standards Needs

On February 24, representatives from 20 units including chips, large models, steel, power, and operators were invited to discuss the industrial needs for the application of domestic large models and important national standards demands.

"AI+" Industry Application Standards Exchange Symposium

On March 5, **12 technical committees** including steel, robotics, petroleum and **13 large central state-owned enterprises** including China Iron & Steel Research Institute, State Grid, China Southern Power Grid, and Chinalco were organized to discuss the current national standard needs for artificial intelligence in various industries, combining DeepSeek's technical practices and industry experience.

Organizing In-Depth AI Standardization Implementation Activities

Organizing in-depth AI standardization implementation activities, dovetailing with the AI-enabled new industrialization deep engagement initiative, covering enterprises, industries, and regions through standards promotion and implementation events and standards weeks.

03 Next Steps

Future Work Plans

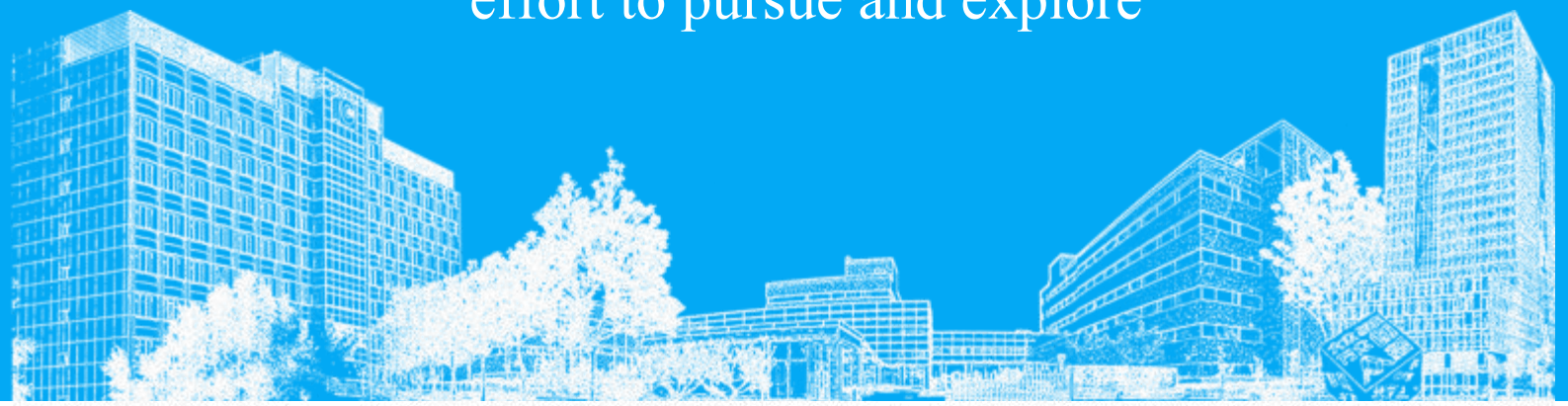
Strengthen Research on Standard Systems and Hot Topics

- Implement the national comprehensive standardization system for the AI industry and establish a dynamic and flexible standard system update mechanism;
- Collaborate with various sector standards association through joint initiatives to support high-quality development of AI-enabled industries with standards. Simultaneously, conduct research on hot topics through technical task groups under the general group.

Continuously Advance AI Standardization Efforts

- Ongoing collection of AI standardization needs. Based on AI technology trends and industry application requirements, develop standards for computing power centers, large models, agents, embodied AI, AI-enabled new industrialization, and security.
- Build and improve the "Qiusuo" national AI standard benchmark system, starting from standard validation and testing, to comprehensively enhance the quality of AI systems and lead industrial development with standards.

Sustain In-Depth International Cooperation

- Advance the work of SC 42/WG 5 on computational methods and AI computing characteristics, attracting more international standardization experts proficient in international rules and specialized technology. Focus on AI algorithm research and contribute more international standard proposals.
- Increase involvement in SC 42, organizing experts to continuously monitor and participate in standardization directions and standard development for working groups such as data quality (WG 2) and AI trustworthiness (WG 3).

"In the pursuit of truth, there is still a long way to go, but I will persevere and spare no effort to pursue and explore"