Translation

The following document is a guide to how China should formulate AI-related standards. The guide governs how China crafts standards for both AI technology itself and for applications of AI in various industries, and is relevant for either domestic or international standards-setting. Note that although this is the "2024 edition" of the guide, CSET has not observed a "2025 edition" as of the publication date of this translation.

Title
Guidelines for the Construction of a Comprehensive Standardization System for the National Artificial Intelligence Industry (2024 Edition)
国家人工智能产业综合标准化体系建设指南（2024 版）

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Source
Website of the Central People's Government of the People's Republic of China (中国政府网). The *Guidelines* are dated June 5, 2024 and were uploaded to the website on July 2, 2024.

The Chinese source text is available online at:
https://www.gov.cn/zhengce/zhengceku/202407/P020240702716282797987.pdf
An archived version of the Chinese source text is available online at: https://perma.cc/S9ZU-TRJT

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Guidelines for the Construction of a Comprehensive Standardization System for the National Artificial Intelligence Industry (2024 Edition)[1]

These *Guidelines* have been formulated in order to thoroughly implement the directives of the Party Central Committee and the State Council on accelerating the development of artificial intelligence (AI), to put into practice the *National*

[1] Translator's note: CSET previously translated a draft version of these guidelines. This translation is available online at: https://cset.georgetown.edu/publication/china-ai-standards-system-guidelines-draft/.

Standardization Development Outline[2] and the *Global AI Governance Initiative*,[3] to further enhance the systematic planning of AI standardization efforts, to accelerate the development of a standards system that supports the high-quality growth of the AI industry and meets the demands of high-level empowerment through "AI+," and to strengthen the foundational role of standards in driving technological advancement, fostering enterprise growth, guiding industrial transformation and upgrading, and safeguarding industrial security.

I. Industry Development Status

AI is a basic and strategic technology that is leading a new round of scientific and technological (S&T) revolution and industrial transformation. It is rapidly becoming a key engine for developing new quality productive forces (新质生产力), accelerating deep integration with the real economy, comprehensively empowering new-style industrialization (新型工业化), and profoundly changing the mode of industrial production and the form of economic development. It will play an important supporting role in accelerating the construction of a manufacturing powerhouse, a cyber powerhouse,[4] and a Digital China. The AI production chain includes four parts: the basic layer, framework layer, model layer, and application layer. The basic layer mainly includes computing power ("compute"), algorithms, and data; the framework layer mainly refers to the deep learning frameworks and tools used for model development; the model layer mainly refers to technologies and products such as large models; and the application layer mainly refers to the applications of AI technology in industry scenarios. In recent years, China's AI industry has achieved rapid development in technological innovation, product creation, and industry applications, forming a market with a massive scale. With the accelerated iteration of new technologies as represented by large models, the AI industry has presented new features such as collective breakthroughs (群体突破) in innovative technology, integrated development of industry applications, and deep collaboration through international cooperation. There is an urgent need to improve the system of standards for the AI industry.

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[2] Translator's note: CSET's English translation of China's National Standardization Development Outline is available online at: https://cset.georgetown.edu/publication/the-chinese-communist-party-central-committee-and-the-state-council-publish-the-national-standardization-development-outline/.

[3] Translator's note: Archived versions of the text of the English and Chinese versions of China's Global Governance Initiative are available online, respectively, at https://perma.cc/F4N3-UGG6 and https://perma.cc/A4E9-XAZQ.

[4] Translator's note: This translation renders the Chinese word 强国 qiángguó—which literally means "strong nation"—in English as "powerhouse," as in the phrases "manufacturing powerhouse" (制造强国) and "cyber powerhouse" (网络强国). For a more thorough discussion in English of the Chinese word qiángguó, see: https://www.newamerica.org/cybersecurity-initiative/digichina/blog/lexicon-wangluo-qiangguo/.

II. Overall Requirements

Guided by Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, fully implement the spirit of the 20th Party Congress and the Second Plenum of the 20th Central Committee, conscientiously implement the deployment requirements of the Central Economic Work Conference and the Nationwide New-Style Industrialization Promotion Conference (全国新型工业化推进大会), fully, accurately, and comprehensively implement the new concept of development (新发展理念), coordinate high-quality development and high-level security, accelerate the empowerment of new-style industrialization, take seizing the development opportunities in the AI industry as our goal, improve the top-level design of AI standards work, strengthen collaboration in standards work through the production chain, coordinate the research, formulation, implementation, and internationalization of standards, and provide solid technical support for promoting the high-quality development of China's AI industry.

By 2026, the degree of linkage between standards and industrial technological innovation shall continue to increase, and over 50 new national standards and industry standards shall be formulated, accelerating the formation of a standards system to promote the high-quality development of the AI industry. More than 1,000 companies shall engage in standards indoctrination, implementation, and promotion, further highlighting the innovation and development performance of standards service companies (标准服务企业). We shall participate in the formulation of at least 20 international standards, promoting the globalized development of the AI industry.

Persist in being innovation-driven: Optimize the linkage mechanisms between industrial S&T innovation and standardization, accelerate research on key general purpose technologies in the field of AI, and promote the efficient conversion of advanced and applicable S&T innovation achievements into standards.

Persist in being application-led: Persist in making enterprises the mainstay and being market-oriented, look to industry application needs, strengthen the iteration of innovation achievements and the construction of application scenarios, and collaboratively promote the integrated application of AI along with key industries.

Persist in industry collaboration: Strengthen collaboration in standardization work throughout the entire AI production chain, strengthen technical organization cooperation in cross-industry and cross-field standardization, and create a standardization model for the integrated development of small-, medium-sized, and large enterprises.

Persist in open cooperation: Deepen international exchanges and cooperation for

standardization, encourage Chinese enterprises and public institutions[5] to actively participate in international standardization activities, and work with upstream and downstream enterprises in the global production chain to jointly formulate international standards.

III. Construction Philosophy

(1) Structure of the AI standardization system

The AI standards system architecture includes seven parts: basic general purpose, basic support, key technology, intelligent products and services, empowerment of new-style industrialization, industry applications, and safety[6] and governance standards, as shown in Figure 1. Here, the basic general purpose standards are the basic, framework, and overall standards for AI. Basic support standards mainly provide requirements for technical aspects such as data, compute, and algorithms, laying a solid technical foundation for the development of the AI industry. Key technology standards mainly regulate the technical requirements for AI text, speech, images, and the technologies used in fields such as human-machine hybrid augmented intelligence (人机混合增强智能), intelligent agents (智能体), cross-media intelligence, and embodied AI, promoting innovations in and applications of AI technology. Intelligent product and service standards mainly regulate intelligent product and service models formed by AI technology. Standards for empowering new-type industrialization primarily specify the technical requirements for applying artificial intelligence to enable full-process intelligent transformation in manufacturing and to support intelligent upgrades in key industries. Industry application standards mainly specify the technical requirements for AI empowerment of various industries, providing technical support for AI empowerment of industry applications and promoting the development of industrial intelligentization. Safety and governance standards mainly specify the requirements for AI safety, security, and governance, providing safety and security assurance for the development of the AI industry.

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[5] Translator's note: "Public institutions" (事业单位) are organizations created and led by Chinese government departments that provide social services. Unlike state-owned enterprises (SOEs), public institutions do not create material products and do not generate income. Public institutions are not considered government agencies, and their employees are not civil servants. Most public institutions are fully or partially government-funded, but some fully privately funded (but still government-led) public institutions exist. Public institutions typically provide services in areas such as education, science and technology, culture, health, and sanitation.

[6] Translator's note: The Chinese word 安全 encompasses the meanings of both "safety" (protection from accidental harm) and "security" (protection from deliberate harm). In this translation, it is variously translated as "safety," "security," or "safety and security" at the translator's discretion.

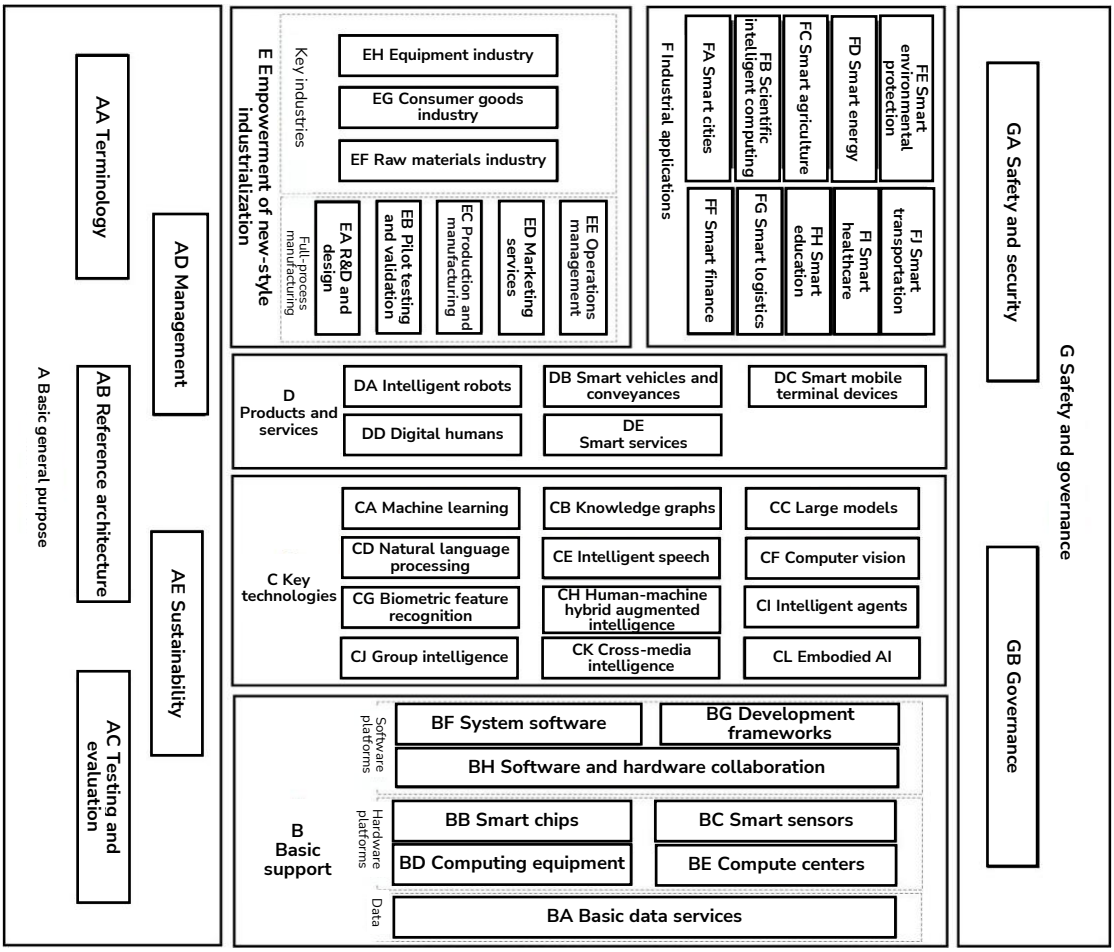

Figure 1. Structural diagram of the AI standards system

(2) AI standards system framework

The AI standards system framework is composed of seven main parts: basic general purpose, basic support, key technology, intelligent products and services, empowerment of new-style industrialization, industry applications, and safety and governance standards, as shown in Figure 2.

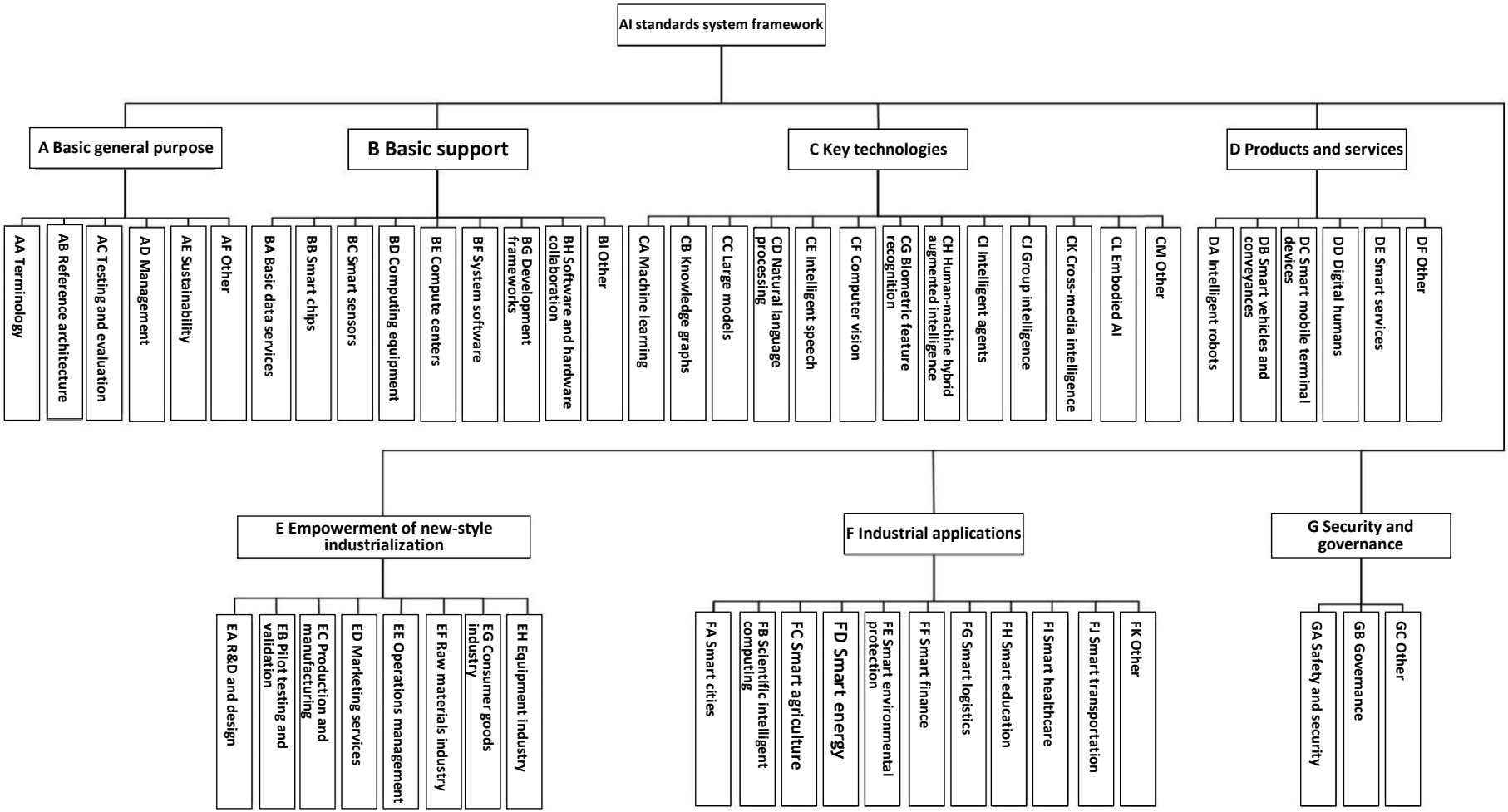

Figure 2 AI Standards System Framework

IV. Key directions

(1) Basic general purpose standards

Basic general purpose standards mainly include AI terminology, reference architecture, testing and evaluation, management, and sustainability.

1. **Terminology standards:** These standards standardize the conceptual definitions used in AI-related technologies and industrial applications, providing a reference for the formulation of other standards and AI research. They include standards for definitions, categories, and examples of AI terms.

2. **Reference architecture standards:** These standards standardize the logical relationships and interactions of AI technologies, applications, and systems, and include standards on AI reference architectures, the artificial intelligence system life cycle, and stakeholders.

3. **Testing and evaluation standards:** These standards standardize the indicator requirements for testing and evaluation of the maturity of AI technology development, for adaptability between AI system architectures, for industry development levels, and for enterprise intelligentization (智能化) capabilities. They include standards for AI-related service capability maturity assessments, AI general applicability (通用性) testing guidelines, assessment principles and level requirements, corporate capability frameworks, and evaluation requirements.

4. **Management standards:** These standards standardize the management requirements and evaluation of all personnel and organizations involved in the life cycle of AI technology, products, systems, or services. They include standards for management requirements for AI organizations, AI management systems, categorization methods, and evaluation processes.

5. **Sustainability standards:** These standards standardize the technical frameworks, methods, and metrics used to measure the impact of AI on the environment and balance industrial development and environmental protection. They include standards for open-source basic frameworks for AI software that promote ecological sustainability, energy efficiency evaluation of AI systems, AI and resource utilization, carbon emissions, and scrap parts disposal.

(2) Basic support standards

Basic support standards mainly cover basic data services, smart chips, smart sensors, computing equipment, compute centers, system software, development frameworks, and software and hardware collaboration standards.

1. **Basic data services standards:** These standards standardize the requirements for data services involved in the R&D, testing, and application of AI. They include standards for data acquisition, data labeling, data governance, and data quality.

2. **Smart chip standards:** These standards standardize general technical requirements related to smart chips. They include standards for smart chip architecture, instruction sets, unified programming interfaces and related test requirements, chip data formats, and protocols.

3. **Smart sensor standards:** These standards standardize the interface protocols, performance evaluation, test methods, and other technical requirements for new single-mode and multimodal sensors. They include standards for smart sensor architecture, instructions, data formats, information extraction methods, information fusion methods, functional integration methods, performance indicators, and evaluation methods.

4. **Computing equipment standards:** These standards standardize the technical requirements and testing methods for AI accelerator cards, AI acceleration modules, AI servers, and other computing equipment as well as their enabling software. They include standards for AI computing equipment virtualization methods, AI accelerator module interface protocols and test methods, and the access protocols, functions, performance, energy efficiency test methods, and operations and maintenance (O&M) requirements of enabling software.

5. **Compute center standards:** These standards standardize the technical requirements and evaluation methods for AI-oriented infrastructure such as large-scale computing clusters, new-style data centers (新型数据中心), intelligent computing centers, foundational network communications, compute networks, and data storage. These include standards for reference architectures, computing capacity evaluation, technical specifications, stability requirements, and service interfaces.

6. **System software standards:** These standards standardize the software and hardware technical requirements of the AI system layer. They include standards for software and hardware compiler architecture and optimization methods, AI operator libraries, chip software runtime libraries and debugging tools, and AI software and hardware platform computing performance.

7. **Development framework standards:** These standards standardize technical requirements related to AI development frameworks. They include standards for the functional requirements of development frameworks, interface protocols between application systems, neural network model expression, and compression.

8. **Software and hardware collaboration standards:** These standards

standardize the adaptation requirements between smart chips, computing equipment, and other hardware and system software, development frameworks, and other software. They include standards for the adaptation requirements of smart chips and development frameworks and the interaction protocols, execution efficiency, and collaborative performance for AI computing task scheduling, distributed computing, and other software and hardware collaborative tasks.

(3) Key technology standards

Key technology standards mainly cover machine learning, knowledge graphs, large models, natural language processing, intelligent speech, computer vision, biometric feature recognition, human-machine hybrid augmented intelligence, intelligent agents, group intelligence (群体智能), cross-media intelligence, and embodied AI.

1. **Machine learning standards:** These standards standardize machine learning training data, data preprocessing, model expression and formats, and model performance evaluation. They include standards for self-supervised learning, unsupervised learning, semi-supervised learning, deep learning, and reinforcement learning.

2. **Knowledge graph standards:** These standards standardize the description, construction, O&M, sharing, management, and application of knowledge graphs. They include standards for knowledge representation and modeling, knowledge acquisition and storage, knowledge fusion and visualization, knowledge computing (知识计算) and management, knowledge graph quality evaluation and interconnection, knowledge graph delivery and application, and knowledge graph system architecture and performance requirements.

3. **Large model standards:** These standards standardize the technical requirements for areas such as large model training, inference, and deployment. They include standards for general technical requirements for large models, evaluation metrics and methods, service capability maturity assessment, and generated content evaluation.

4. **Natural language processing standards:** These standards standardize the technical requirements and evaluation methods for language information extraction, text processing, and semantic processing in natural language processing. They include standards for parsing (语法分析), semantic understanding, semantic expression, machine translation, automatic summarization, automatic question answering, and large language models (LLMs).

5. **Intelligent speech standards:** These standards standardize the technical

requirements and evaluation methods for front-end processing, speech processing, speech interfaces, and data resources. They include standards for deep synthesis (深度合成) deepfake detection (鉴伪) methods, full-duplex (全双工) interaction, and LLMs.

6. **Computer vision standards:** These standards standardize technical requirements and evaluation methods for image acquisition, image and video processing, image content analysis, three-dimensional computer vision, computational photography, and cross-media fusion (跨媒体融合). They include standards for functionality, performance, and maintainability.

7. **Biometric feature recognition standards:** These standards standardize technical requirements for biometric sample processing and biometric data protocols, equipment, and systems. They include standards for biometric data exchange formats and interface protocols.

8. **Human-machine hybrid augmented intelligence standards:** These standards standardize multi-channel, multimodal, and multidimensional interaction pathways, modes, methods, and technical requirements. They include standards for brain-computer interface, online knowledge evolution, dynamic self-adaptation (动态自适应), dynamic recognition, human-computer coordinated perception, and human-computer coordinated decision-making and control.

9. **Intelligent agent standards:** These standards standardize the technical requirements for intelligent agents with general purpose large models as their focus, for basic agent functions, and for application architecture. They include standards for intelligent agent reinforcement learning, multi-task decomposition, inference, prompt engineering, intelligent agent data interfaces and parameter ranges, human-computer collaboration, intelligent agent autonomous operations, and multi-agent distributed consensus.

10. **Group intelligence standards:** These standards standardize the technical requirements and evaluation methods for the control, formation, perception, planning, decision-making, and communication of group intelligence algorithms. They include standards for autonomous control, collaborative control, task planning, path planning, collaborative decision-making, and networked communication.

11. **Cross-media intelligence standards:** These standards standardize the technical requirements for multimodal data processing, conversion analysis (转换分析), and fusion applications for text, images, video, audio, and other media. They include standards for data acquisition and processing, modal conversion, modal alignment, fusion and collaboration, and application expansion.

12. **Embodied AI standards:** These standards standardize multimodal initiative

and interaction, autonomous behavioral learning (自主行为学习), emulation and simulation, knowledge inference, embodied navigation, and group embodied AI.

(4) Intelligent Product and Service Standards

Intelligent product and service standards mainly cover intelligent robots, smart vehicles and conveyances (智能运载工具), smart mobile terminal devices (智能移动终端), digital humans, and smart services.

1. **Intelligent robot standards:** These standards standardize the technical requirements for the application of artificial intelligence in the field of robotics. They include standards for intelligent perception and intelligent decision-making in robots.

2. **Smart vehicle and conveyance standards:** These standards standardize the technical requirements for smart vehicle and conveyance perception, identification and prediction, collaboration and gameplay (博弈), decision-making and control, and evaluation. They include standards for environmental fusion perception, intelligent identification and prediction, intelligent decision-making and control, and multimodal testing and evaluation.

3. **Smart mobile terminal device standards:** These standards standardize the technical requirements for AI applications in the field of mobile terminal devices. They include standards for image recognition, facial recognition, and intelligent speech interaction, as well as for the information accessibility and elder-friendliness of intelligent mobile terminal devices.

4. **Digital human standards:** These standards standardize the technical requirements for digital human appearance, motion generation, speech recognition and synthesis, and natural language interaction. They include standards for digital human basic ability assessment, multimedia synthesis rendering, basic data collection methods, and identification and recognition methods.

5. **Smart service standards:** These standards standardize services provided based on artificial intelligence technologies such as large models, natural language processing, intelligent speech, and computer vision. They include technical requirements and evaluation methods for model-as-a-service (MaaS) platforms, as well as standards for AI application services in specific scenarios, such as intelligent software development, smart design, and intelligent deepfake prevention (防伪).

(5) Standards for Empowering New-Style Industrialization

Standards for empowering new-style industrialization primarily include intelligentization standards for the entire manufacturing process. They include R&D and design, pilot testing and validation, production and manufacturing, marketing

services, and operations management, as well as standards for intelligent upgrades in key industries.

1. **R&D and design standards:** Develop standards for cross-domain knowledge integration, the generation of new design patterns, and human-computer coordinated research and development.

2. **Pilot testing and validation standards:** Focus on high-precision, full-process simulation models; develop standards for intelligent virtual pilot testing and the application of new technologies in complex industrial scenarios.

3. **Production and manufacturing standards:** Develop standards for intelligentized production processes, production line monitoring, and maintenance.

4. **Marketing service standards:** To enhance the efficiency of marketing services, develop standards for intelligent customer service, digital humans, 3D product models, and user experience.

5. **Operations management standards:** With a focus on improving the intelligentized capabilities of operations management, develop relevant standards for supply chain management, data management, and risk management.

6. **Key industry intelligent upgrade standards:** For the raw materials industry, develop standards for the smooth coupling of large models with production line data, optimization of online monitoring and control, and process improvement. For the consumer goods industry, develop standards for demand forecasting and personalized customization. For the equipment industry, develop standards for intelligent equipment perception, interaction, control, collaboration, and autonomous decision-making.

(6) Industry Application Standards

Conduct standardization research in areas such as smart cities, scientific intelligent computing, smart agriculture, smart energy, smart environmental protection, smart finance, smart logistics, smart education, smart healthcare, smart transportation, and smart culture and tourism.

(7) Safety and Governance Standards

Safety and governance standards cover safety, security, and governance in the AI field.

1. **Safety and security standards:** These standards standardize safety and security requirements throughout the lifecycle of AI technology, products, systems, applications, and services. They include standards for basic safety and security, data, algorithm, and model safety and security, network technology and system security,

safety and security management and services, safety and security testing and evaluation, safety labeling, content identifiers, and product and application safety and security.

2. Governance standards: Considering the actual needs of AI governance, these standards standardize the requirements for AI technical R&D and operational services, including technical requirements and evaluation methods for the robustness, reliability, and traceability of AI, AI governance support technology, and ethical governance requirements for the total AI life cycle. They include standards for AI ethical risk assessment, AI fairness, explainability, and other ethical governance technical requirements and evaluation methods, and AI ethical review.

V. Assurance Measures

(1) Improve organization building: Establish and improve technical organizations for standardization in the field of AI, coordinate the strengths of all stakeholders across industry, academia, research institutes, and users, as well as all segments of the production chain, and jointly advance the development of AI standards to build a sophisticated and applicable standards system for the AI industry.

(2) Build a talent cadre: Encourage standardization research institutions to cultivate and recruit elite standardization talents and strengthen special training for standardization practitioners. Encourage enterprises, universities, research institutions, and other organizations to include standardization talents in the scope of their professional ability assessment and incentives and to build standardization talent tiers (人才梯队).

(3) Increase indoctrination and promotion: Guide industry associations, standardization technical organizations, and national technical standards innovation bases to carry out indoctrination and training on AI standards systems and key standards for the benefit of enterprises. Guide enterprises to comply with relevant standards in the R&D, design, production, management, quality testing, and other stages and continuously improve the efficacy of standards in facilitating the high-quality development of industries.