SESEC V Report

The Plenary Meeting of
 SAC/TC28/SC42 Artificial Intelligence

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Seconded European Standardization Expert in China
(SESEC)

Report on the Plenary Meeting of SAC/TC28/SC42 Artificial Intelligence

On December 22, 2023, the plenary meeting of the Artificial Intelligence Technical committee of the Standardization Administration of China (SAC/TC28/SC42) was held in Xi'an. The SAC/TC28/SC42 is an AI-dedicated national technical committee mirroring ISO/IEC JTC 1/SC42. Its secretariat is set within the China Electronics Standardization Institute (CESI). Its work scope involves the development of basic and generic standards, technology standards, risk management standards, trustworthiness standards, governance standards, products and applications standards.

The plenary meeting of SAC/TC28/SC42 was divided into two parts: a plenary session and meetings of various working groups. Mr. Wu Wenjun, deputy leader of the National AI Standardization General Group, Mr. Fan Kefeng, deputy secretary general of the National Information Technology Standardization Technical Committee (SAC/TC28) and director of the Information Technology Research Center of CESI, Ms. Lin Ning, chairperson of the SAC/TC28/SC42, Mr. Wu Fei, deputy chairperson of the SAC/TC28/SC42, attended the plenary session.

Director Fan Kefeng pointed out in his speech that the SAC/TC28/SC42 will focus on standardization work, promote the project and development of standards in the field of big model and AI enabled industry application, organize domestic experts to actively participate in international standardization work, and make contribution to international standardization based on China' needs. In addition, the plenary session announced the decision on the adjustment of the group leader of the established working groups and the appointment of the new working group leaders. Here in the following is the summary of key takeaways of the plenary meeting and meetings of specific working groups:

1. Adjustment in working groups:

At present, there are 14 working groups under SAC/TC28/SC42, of which 6 are newly established, including the working group of intelligent computing, AI application in electric power industry, smart living, humanoid robot, open-source, medical application. The medical application working group will be led by the National Health Commission of China, and individual hospitals will participate in its standardization activities as members. In addition, a few working groups are proposed to be established in the future, including the working groups of AI for science, as well as AI application in iron and steel, energy, railway construction, as well as communication. The new working groups of AI applications in various industries will be established in joint efforts with other industrial stakeholders.

2. Policy support

In addition, as the supporting units for China's national ministries and committees, the SAC/TC28/SC42 respectively supported the Ministry of Industry and Information Technology (MIIT) and the Ministry of Science and Technology (MOST) to complete the preparation of the following policy documents (see the Table 1). Specifically, within the MIIT, it is the Department of Science and Technology that is supported by the SAC/TC28/SC42.

Table 1: List of Documents Supported by SAC/TC28/SC42 to MIIT and MOST

Ministerial Departments	Policies or normative documents supported by SAC/TC28/SC42
MIIT	✓ *Implementation Plan for the Leading Engineering of Standardization in New Industries (2023-2035)* (published) ✓ *Notice on Organizing and Implementing Future Industrial Innovation tasks 2023* ✓ *National Guidelines on Construction of AI Industrial Comprehensive Standard System* (the new revision, which is in the phase of "call for comment") ✓ Other AI industrial policies
MOST	✓ *Ethical Guidelines for Research in Artificial Intelligence Technologies* (draft completed) ✓ *White Paper on Standardization of Ethical Governance in AI* (published)

3. AI standard system revision

The new standard system represented in National Guidelines on Construction of AI Industrial Comprehensive Standard System (draft for comments) has major adjustment in structural optimization, and specific parts, including part C, part E, Part F, Part G. For the revised AI standard system, please refer to Figure 1. An important driving force behind the revisions lies in the fact of the rapid development of big models, which has brought revolutionary changes to the AI industry. Against this backdrop, the old standards system failed to provide proper guidelines for future AI standard development.

Figure 1. The National Artificial Intelligence Standard System
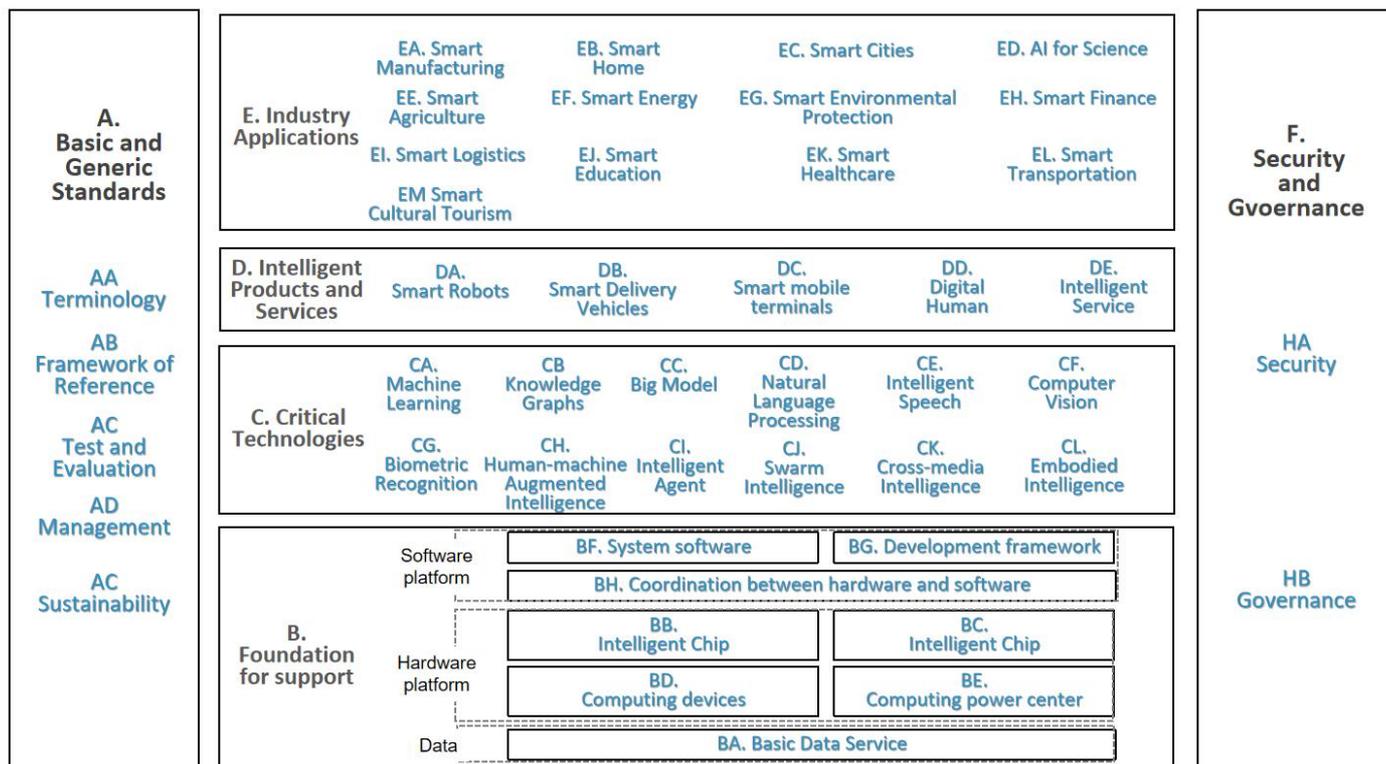
4. Standard development:

4.1 Statistics:

There are 5 published national standards, 11 national standards under development, 9 standard project to be officially established; 12 sector standard under research, 3 sector standards to be officially established. Specifically, in the field of AI, if SAC deems that the one standard mainly regulates AI application in industries, such standard project can only be proposed as sector standards, instead of national standards. This is especially the case for standards related to computer vision according to the secretariat of the working group.

4.2 Key Working Area 1: Software-hardware adaptation.

The SAC/TC28/SC42 has established the AI hardware-software Adaptation standard system (please refer to Table 2). Under this framework, the efforts are devoted to the standard development of basic software and hardware, deep-learning framework, model and algorithm, product and services, as well as compatibility and adaptation, covering the accelerating units, frameworks, models, and interfaces. The reason for prioritizing the software-hardware adaptation is because China is promoting the domestically produced chips, servers, and framework adaptation. Under such background, there once was a discussion over the proposal of integrating AI standard development in the work of information technology application innovation standardization since the latter is dedicated to supporting the domestic production of information technology products. Yet, no agreement was reached on that proposal.

Table 2: AI Hardware-Software Adaptation Standard System and Critical Standards

	Category	No.	Standards
AI Software-hardware Adaptation Standard System	Basic hardware materials adaptation standards	1	*T/CESA 9166—2020 Technical specification for artificial intelligence server*
		2	*Specification for unified interfaces for artificial intelligence accelerating units*
		3	*20221793-T-469 Artificial intelligence - Computation scheduling and cooperation - Part 1: Virtualization and Scheduling*
		4	*20221793-T-469 Artificial intelligence - Computation scheduling and cooperation - Part 1: Virtualization and Scheduling*
	Machine learning framework and algorithm & model adaptation standards	5	*20221795-T-469 Artificial Intelligence-Technical Specification for Multi-Hardware Platform Integration of Deep Learning Framework*
		6	*Technical requirements for deep learning framework*
		7	*T/AI 117—2022 Application Programming Interface (API) for Deep Learning Inference Engine*
		8	*20230717-T-469 Information Technology -- Neural Network Representation and Model Compression -- Part 2: Large Scale Pre-training Model*
		9	*20230718-T-469 Information Technology — Neural network representation and model compression — Part3: Graph Neural Network*
	Smart products and service standards	10	*AI risk assessment model*
		11	*Specification for trustworthy evaluation of AI systems*

4.3 Key Working Area 2: Open source

The key topic of the working group meeting is on a standard of Artificial intelligence - Technical requirements for open-source model service platform. It is for the service platform of open-source models, not for the open-source platforms. To be specific, it is used for platforms that offer services for open-source models. The discussion at the working group meeting was rather short and brief, as the standard formulation was in a rather preliminary stage (not even officially established as a standard project). The working group is still evaluating whether the standard should be an association or a national one. For next steps, the working group experts agreed to make a further clarification of the standard contents and scope and call for joint efforts from open-source and relevant experts/organizations to form a better synchronization in this sector.

4.4 Key Working Area 3: AI governance

4.4.1 AI management system

China intends to convert the ISO/IEC 42001 Artificial intelligence management system into a national standard in an identical manner. The National Certification and Accreditation Administration will be involved to support and ensure proper implementations of the ISO/IEC 42001 and the series standards of AI management system in China, similar to the their support for ISO 9000 Quality management. The SAC/TC28/SC42 believes that ISO/IEC 42001 is fundamental and useful for future third-party conformity assessment and certification to ensure compliance with the international recognized AI management system. The conversion will be soon carried out after the SAC has addressed the patent issue with ISO/IEC over the ISO/IEC 42001.

4.4.2 Trustworthy AI

The followings are the summary of the deliverable of SAC/TC28/SC42 in trustworthy AI standardization:

1) Three national standard projects have been officially established, including:

✓ 20221450-T-469 Artificial intelligence—Deep learning algorithms evaluation (under development)

✓ Artificial intelligence - Trustworthiness - Part 1: General rules (under development): The national standard will be developed based on the newly published association standard T/CESA 1304-2023 that shares the same name while also refer to ISO/IEC standards developed by ISO/IEC/JTC1/SC42/WG3.

✓ Artificial Intelligence - Risk Management Capability Assessment (under development): The association standard T/CESA 1193—2022 that shares the same name was prepared to contribute to this national standard. Yet, the secretariat believes that the association standard is insufficient to be converted into the national standards due to its limitations. Therefore, they intend to draft a completely new version for national standard.

2) Two published association standards

✓ T/CESA 1297-2023 Artificial intelligence - Specification for trustworthiness for computer vision systems

✓ T/CESA 1304-2023 Artificial intelligence - Trustworthiness - Part 1: General rules

3) Two published research papers

✓ Guidelines on AI Ethical Governance Standardization

✓ White Paper on Generative AI Governance and Practice

4.5 Key Working Area 4: computational power testing

Compared with MLPerf and other international advanced computing benchmarks, CESI has developed an association standard of T/CESA 1169-2021 Information technology - Artificial intelligence - Specification for performance benchmarking for server systems, the IEEE 2937-2022 Performance Benchmarking for Artificial Intelligence Server Systems, and is currently promoting the related national standard (20221794-T469). It is a typical case where the association standard is being treated as the upgrading foundation for development of international or national standards. In this process, the mainstream AI server system and component manufacturers and AI application providers in China and abroad, such as Huawei, Inspur, Sugon, and NVIDIA, have participated in the standard formulation. Meanwhile, the supporting testing tool, namely the AIS Bench, has also been developed. The features of AISBench test tool include:

✓ Being able to run on a variety of AI computing devices + deep learning frameworks +OS environments to obtain performance data of AI servers;

✓ Diverse testing content, which can meet the different needs for different purposes of usage;

✓ Consistent test methods and procedures with international ones, and being able to be updated in time according to industrial development;

✓ Compliance with standards in terms of its design and development.

4.6 Key Working Area 5: big model

The SAC/TC28/SC42 identified issues in big model area where standardization can make contributions, such as the lack of unified concept and terminology, diverse types of product with different requirements, complicated testing and assessment methods, as well as issues in trustworthiness and security. To solve them, SAC/TC28/SC42 has been devoted efforts from two perspectives: big models and data quality. A series of standards have been published or under development, including:

Big model standards:

✓ 20231736-T-469 Artificial intelligence - pre-trained models - Part 1: General requirements (national standard under development)

✓ 20231746-T-469 Artificial intelligence - pre-trained mode - Part 2: Evaluation index and method (national standard under development)

✓ 20231741-T-469 Artificial intelligence - Pre-trained models - Part 3:Service capability maturity assessment (national standard under development)

✓ IEEE P3142 Recommended Practice on Distributed Training and Inference for Large-scale Deep Learning Models (IEEE standard under development)

Data quality standard:

✓ ISO/IEC FDIS 5259-4 Artificial intelligence - Data quality for analytics and machine learning (ML) - Part 4: Data quality process framework

4.7 Engagement in international standards development

At present, the SAC/TC28/SC42 has been tracking the dynamics of ISO/IEC JTC1/SC42 and engaging standardization activities of both ISO/IEC JTC1/SC42 and IEEE. The SAC and the MIIT hope to witness an increase in number of international standard proposals raised by China. Specifically, the SAC is concerned about each vote taken place in ISO/IEC JTC1/SC42, especially about their impacts on China. To minimize duplication of efforts between China and the international community, the SAC mandates, in principle, to convert all the standards published by ISO/IEC JTC1/SC42 that should be converted.

At the same time, the secretariat manages the registration of experts to participate in standardization activities of ISO/IEC JTC1/SC42. During the meeting, the secretariat announced the plan of revoking the registration qualifications of around 50% experts (i.e. 42 persons out of 85 covering 90% of working groups of ISO/IEC JTC1/SC42) for their inactivity and called for new rounds of applications of experts. The adjustments in registration are part of the efforts to strengthen the team building for better engaging in international standardization activities, as very few registered experts remain active. Apart from ISO/IEC and IEEE, the standardization activities of NIST, CEN/CENELEC, national standardization bodies of BRICS will also be monitored.

4.7.1 Engagement in IEEE standard development:

The IEEE Std 2937 Performance Benchmarking for Artificial Intelligence Server Systems led by CESI is published; Besides, in big model area, the standard working group chaired by Chinese experts are IEEE AISC/LSDLM, IEEE P3342, IEEE P3378, and IEEE P3820.

4.7.2 Engagement in ISO/IEC JTC1/SC 42:

A total of 6 standards are developed or under development with the China playing the leading role, accounting for 12% of total standard projects under ISO/IEC JTC1/SC 42. The four under-development ones are:

✓ ISO/IEC DIS 5259-4 Artificial intelligence - Data quality for analytics and machine learning (ML) - Part 4: Data quality process framework

✓ ISO/IEC CD TS 8200 Information technology - Artificial intelligence - Controllability of automated artificial intelligence systems

✓ ISO/IEC AWI 5392 Information technology - Artificial intelligence - Reference architecture of knowledge engineering

✓ ISO/IEC TR 17903 Information technology - Artificial intelligence - Overview of machine learning computing devices

For each of the working groups set under ISO/IEC JTC1/SC42, SAC/TC28/SC42 has identified key concerns for further following up. For example, in JWG 2, China's main focuses are on ISO/IEC TS 29119-11 Software and systems engineering - Software testing Part 11: Testing of AI systems, and ISO/IEC AWI TS 17847 Information technology Artificial intelligence Verification and validation analysis of AI systems.

5. Next step

In the next step, the main focus of SAC/TC28/SC42 will be on the following tasks: Establishing new working groups, as

aforementioned; Completing the revision of the AI standard system; and Promoting four international standards led by Chinese experts. Additionally, for standard development, SAC/TC28/SC42 has identified six specific work focuses, each associated with certain topics. It is important to note that these work focuses may not be completely identical to the key working areas concluded during the plenary meeting. The work focuses include: AI software-hardware adaptation, Humanoid robots, Big models, AI applications, AI for science and AI governance.

6. Summary and conclusion

On the AI policy level, the secretariat of SAC/TC28/SC42 continues to provide support for the MIIT and the MOST in China. Their main focus is on the revision of the national AI standard system, which is influenced by the rapid development of big models and generative AI.

In terms of organizations, the SAC/TC28/SC42 is planning to expand further. They will establish more working groups specifically dedicated to different AI applications. For example, the medical application working group will be led by the National Health Commission of China, and individual hospitals will participate as members, contributing to standardization activities within the group.

The work of SAC/TC28/SC42 covers various aspects. Some of the key focuses include AI software-hardware adaptation, humanoid robots, big models, AI applications, AI for science, and AI governance.

To meet the needs of the industry effectively, the SAC/TC28/SC42 will consider different types of standards for development. These include association standards, sector standards, national standards, and international standards. This approach ensures a diverse range of standards are considered and developed to cater to the specific requirements of different stakeholders in the industry.

In conclusion, the SAC/TC28/SC42's focus has been adjusted in response to the influential revolution in big model and generative AI. These adjustments involve revising the AI standard system and actively exploring the potentials and industry needs of relevant standards. Additionally, the increasing applications of AI in various fields have necessitated the expansion of SAC/TC28/SC42 through collaborative efforts from relevant stakeholders. The effectiveness of these joint efforts remains uncertain.

With regards to the conversion of international standards, one mandate highlighted during the plenary meeting is to convert all international standards that should be converted. This highlights China's alignment with international communities in terms of AI standard development.

Introduction of SESEC Project

The Seconded European Standardization Expert in China (SESEC) is a visibility project co-financed by the European Commission (EC), the European Free Trade Association (EFTA) secretariat and the three European Standardization Organizations (CEN, CENELEC and ETSI). Since 2006, there has been four SESEC projects in China, SESEC I (2006-2009). SESEC II (2009- 2012), SESEC III (2014-2017), SESEC IV (2018- 2022) and SESEC V (2022-2025). Dr. Betty XU is nominated as the SESEC expert and will spend the next 36 months on promoting EU-China standardization information exchange and EU-China standardization cooperation.

The SESEC project supports the strategic objectives of the European Union, EFTA and the European Standardization Organizations (ESOs). The purpose of SESEC project is to:

● **Promote European and international standards in China;**

● **Improve contacts with different levels of the Chinese administration, industry and standardization bodies;**
● **Improve the visibility and understanding of the European Standardization System (ESS) in China;**
● **Gather regulatory and standardization intelligence.**

The following areas have been identified as sectoral project priorities by the SESEC project partners: Internet of Things (IoT) & Machine-to-Machine(M2M) communication, communication networks & services, cybersecurity & digital identity, Smart Cities (including transport, power grids & metering), electrical & electronic products, general product safety, medical devices, cosmetics, energy management & environmental protection (including eco-design & labeling, as well as environmental performance of buildings).