

Development Strategy for Standardization System of Producer Services

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Abstract: A standardization system is essential for the high-quality and integrated development of producer services. The standardization system of producer services in China still needs improvement in standards coverage, effective supply, and internationalization. Therefore, establishing a standardization system that is scientifically regulated, technologically advanced, and progressive is urgently needed for producer services. In this article, we study the development trend of producer service standardization, analyze the development status of producer services standardization in China and abroad, and summarize the problems faced in constructing a producer services standardization system in the new era. Moreover, the development goals, key directions, and implementation paths of the producer services standardization system for 2025 and 2035 are proposed. To provide technical support for standardizing China's economic system, the standardization system of producer services should be improved to satisfy the demand for high-quality development. Additionally, standards for new service formats should be formulated on time, the connection of standards systems between producer services and other industries should be promoted, standardization personnel should be cultivated, and internationalization of standards should be encouraged.

Keywords: producer services; standardization system; standards internationalization

1 Introduction

With the optimization of the economic structure, the added value of the service sector in China's GDP rose from 50.5% in 2015 to 53.9% in 2019. Big data, cloud computing, the Internet of Things (IoT), and other new technologies, business forms, and models have been gradually applied to the service industry. Producer services, especially high-tech services and e-commerce, show a rapidly growing trend and play a prominent role in supporting the transformation and upgrading of the manufacturing industry [1], modernization of agriculture [2], and assisting the industry in extending to the middle and high end of the value chain. A consensus has been reached on speeding up producer services development, promoting the development of professional and high-end production services through standardization, and enhancing the overall competitiveness of the industrial system.

The standardization system has attracted industry attention as significant support for promoting high-quality and integrated development of producer services. In 2015, the State Council of China published the *Development Plan*

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of the National Standardization System (2016—2020). The development plan is intended to speed up agricultural modernization and new rural standardization system construction, improve the industry standards system, strengthen the productive service industry standards and pilot demonstration, promote the services sector, industry, and agriculture at a higher level of organic integration, and promote the construction of a standardization system for producer service industries [3]. In the transportation industry, railways, highways, water transportation, civil aviation, and postal industries have established their industry standards systems, integrating and regulating the transportation industry, engineering construction, information technology road transportation, and other aspects. In particular, postal services are promoted to reach villages and factories and go abroad. In the financial sector, it has been proposed that the development of a standards system that focuses on banking, securities, and insurance to assist the financial sector in serving the real economy, preventing financial risks, deepening financial reforms and opening-up, and providing better service to society should be promoted. The standard system is gradually being established in the science and technology service industry. The standardization process of science and technology platforms, science and technology assessment, and science popularization services is steadily advancing. Standardization allows the science and technology service industry to move toward a more standardized and ordered science and technology service environment and effectively promote innovation-driven development.

Producer services are highly connected to agricultural and manufacturing industries. The standardization of producer services makes the dual effect of “standardization +” producer services more prominent. This effect can help improve the industrial chain, enhance the value chain, and effectively complete the supply chain. However, the standardization system of producer services in China is still in the middle stages and needs improvement. In practice, many problems appear, such as limited standards, inadequate supply, and internationalization problems. These problems put forward new requirements for serving a more advanced agricultural modernization, manufacturing, and industrial integration, and stimulate the demand for a sound standardization system of producer services that is scientific, standardized, and progressive. This paper focuses on the developmental requirements of building a modern economic system in 2035, based on the current situation of the standardization system construction of producer services in China, proposes developmental strategies for promoting the construction of a standardization system of producer services because of new developmental characteristics and trends, in order to effectively support industrial innovation and development.

2 The producer services standardization development

The development of producer service standardization affects the construction and implementation of a standardization system. Emerging technologies, such as big data, cloud computing, and artificial intelligence (AI), have been widely applied to producer services, bringing about significant changes in the standardization of producer services and putting forward new requirements and tasks.

2.1 Industrial integration

Internal integration for producer services with modern agriculture, advanced manufacturing, and producer and living services has become more prominent. Building a service-oriented integrated industry of primary, secondary, and tertiary industries is imperative. This also objectively requires the standards system of producer services in the coordinated industries to break the original limitation of standardization, and systematically analyze the relationship mechanism of cross penetration, interaction, and cross-border integration between producer services and other industries to form the superposition effect of “service standards+” the standards system.

2.2 Gradual application of emerging technology-management models

The dependence between producer services and advanced manufacturing industries is increasing. Emerging technologies (e.g., industrial Internet and intelligent video surveillance systems) and organizational management mechanisms (e.g., lifecycle management and supply chain management) for the manufacturing industry are gradually being applied to producer services. In 2019, fifteen government departments, including the National Development and Reform Commission and the Ministry of Industry and Information Technology, jointly published the *Guidelines on Promoting the Deeper Integrated Development of Advanced Manufacturing and Modern Service Industry*. They proposed the requirement to “deepen business linkages, extend chains, promote technologies, and explore new business type, mode, and path” and to “integrate the two industries as an important support to promote the high-quality development of the manufacturing industry.”

Practices and policies have put forward new ideas for the standardization of producer services. Service standards in the service industry are mostly made by referring to international standards, and the content of standards is often formulated from the consumer's perspective. However, it ignores the embodiment and role of technology in service standards to some extent. It is necessary to reflect the technical elements of producer service standards in the new era fully and meet the standard requirements of applying technical organization and management modes in producer services.

2.3 Digital and intelligent features

The development of digitalization and intelligence in the service industry has led to the development of service standards. Many developed Western countries and regions have proposed digitalization and intelligent plans, such as *German Digital Strategy 2025* in Germany and *Shaping Europe's Digital Future* in the European Union, which actively promote the combination of digitization and intelligentization. China demonstrates that it will actively promote the deep integration of the Internet, big data, AI, and the real economy and speed up the digitalization, networking, and intelligent development of manufacturing, agriculture, and service industries.

When intelligence is implicated in the producer services industry, data becomes an essential factor in production and makes important contributions in terms of new types of consumption, job creation, inclusive finance, activation of productivity, and reconstruction of the credit system [4]. The intelligent application scenarios of the productive service industry continue to increase, such as the exploration and application of drones and unmanned vehicles in the express delivery industry and the mature promotion of intelligent transportation and intelligent hubs in the transportation industry. Comprehensive systemization and intelligent interconnection have become key factors in promoting producer service standards systems. In June 2019, the International Organization for Standardization (ISO) Central Secretariat held a service standardization forum in Singapore under the theme "Disruptive technologies and new service models: the role of international standards." During the forum, it is widely agreed that the current service industry's new technology and service model is a rapid iteration, especially the implication of chain blocks and big data in the service industry, which has brought fundamental reforms. However, the formulation and implementation of these standards are still far from the actual needs. Global action is required to target and regulate the new technology of data security, privacy, non-standard products trading, and other key areas to speed up and promote related standards. It effectively protects the legitimate rights and interests of consumers.

2.4 Internationalization of service industry standards

The establishment of a high-quality service industry standardization system is inseparable from the internationalization of the service industry standards. Presently, Chinese trade in services have grown continuously and rapidly. The import and export trade in services is becoming the second-largest worldwide. The service trade deficit is relatively extensive, which is at the forefront of the world. In 2018, the proportion of import and export trade in services increased to 11.5%, reaching 5.24 trillion CNY, representing continuous and steady growth year by year. Specifically, there are six trade surplus sub-items in China, which comprise processing services; maintenance and repair services; construction; financial services; telecommunications, computer, and information services; and other business services. Six sub-items are trade deficits, including transportation; travel; insurance and pension services; intellectual property usage fees; personal, cultural and entertainment services; and government services not mentioned elsewhere [5].

With the increasing scale of trade in services in China and the simultaneous growth of globalization and regional trade, it is necessary to continue to build service industry standards to promote the development of the service trade. The 19th National Congress of the Communist Party of China CPC report clearly stated that "supporting the optimization and upgrading of traditional industries, accelerating the development of modern service industries, and aiming to improve international standards." It also shows the objective requirement of further acceleration in the internationalization process of the producer services industry standards.

3 The development of the producer services industry standardization system

The construction of a standardization system for the producer service industry has gradually attracted internal and external attention. As of 2017, the ISO established 334 technical committees (TCs), but service-related TCs were established later than others. Specifically, until 2000, only financial service TCs were established. From 2000

to 2010, five technical standardization committees were established in service areas. After 2010, with the development of the service economy and the increase in the proportion of trade in services, ISO gradually realized the importance of service standards and organized TC intensively in more than 20 service areas, including human resources, business management, organizational governance, and an aging society. The service is intangible and heterogeneous. Service standardization is more challenging to establish, and the total number of service standards is small. According to statistics, the proportion of service standards established by the ISO is only 3%.

3.1 The development of producer services industry standardization system in China

3.1.1 Chinese national standards for producer services

The service industry has become a booster in developing the Chinese national economy. The number of national standards for the service industry in China continues to rise, accounting for approximately 15% of the total national standards [6], with more than 5000 standards [7]. Among these standards, the producer services industry standards exceed 2000, accounting for more than 50% of the total number of national standards in the service industry. Information technology standards, intellectual property standards, and e-commerce standards account for more than 85% of the national standards for the producer services industry. The sum of the logistics construction, financial leasing, inspection, testing and certification, and energy conservation and environmental protection related standards is less than 15%. Overall, the current producer services industry covers key areas of standards. Many innovations have emerged in information technology, intellectual property, e-commerce, and logistics. Standardization has achieved remarkable results and has strongly promoted industrial development.

3.1.2 The productive service industry standards system

The producer services industry promotes the construction of a standardization system, integrates technology, service, management, and other factors based on its development characteristics, carries out standardization, and supports the promotion and application of technology in various fields and service management innovation. For example, the *Transportation Standardization System* applicable in transportation involves comprehensive transportation, railways, civil aviation, highways, water transportation, postal, and other standards. The *Financial Industry Standardization System Construction and Development Plan (2016–2020)*, proposed in the financial field, entails four major standardization tasks: standards formulation and revision; implementation; publicity; and internationalization. In the *Five-Year Action Plan for Information Technology Service Standardization (2016–2020)* and *Guiding Opinions on the Construction of the Intellectual Property Service Standard System*, the documents illustrate the healthy and orderly development of the knowledge-intensive technical service industry standards system.

3.2 The development of the international producer services industry standards system

Developed countries have seized the high ground of international service standardization one after another, and the construction of the international production service industry standards system has been steadily advancing. In ISO, there are 24 TCs or project committees (PCs). Nearly 73% of the service sector standards TC was undertaken by the United Kingdom, Germany, the United States, and France. Other developed countries, such as Japan, Australia, South Korea, Israel, Switzerland, Sweden, and Italy, undertook one international standards TC or PC. However, only China, Malaysia, and South Africa undertook the corresponding service fields TC or PC among developing countries. Specifically, in the international production services industry standards system, the United States plays a dominant role in financial services, project management, human resource management, and healthcare services. The United Kingdom has advantages in facility management, occupational health and safety, business management, organizational governance, and an aging society. Germany plays a leading role in socialization, high-quality education, railway operations, wastewater management, recycling, and road operation services. France plays an important role in water supply, wastewater and rainwater system-related services, innovative management, and online reputation. Sweden has advantages in road traffic safety, safety, and flexibility standards. Spain plays a leading role in markets, public opinion, social surveys, tourism, and related services. China plays a leading role in brand evaluation and e-commerce quality assurance. Standardizing the international producer services industry will help seize the right to speak in future international standards formulation and revision in key service industry areas. It occupies a dominant position in future international service trade.

4 The problems faced by the standardization system of the producer services industry

4.1 The main body of the standards system needs to be expanded

The *Statistical Classification of Producer Services Industry (2019)* was published by the China National Bureau of Statistics [8]. It defines the scope of the producer services industry, illustrating ten major categories and 35 sub-sections and many industries related to the producer services, including R&D services, cargo transportation, general aviation production, warehousing, and postal services. The development of the producer services industry standards is government-guided, and the spontaneously formulated standards lack technical indicators, management regulations, and adequate supply. The form of standards is too limited to meet public demands.

4.2 Standards are inadequate in the application scenarios of new technologies and new business formats

With the continuous emergence of new technologies, the producer services industry has shown a development trend of diversified services, intelligent interconnection, green environmental protection, safety, and convenience. The latest established and reexamined Chinese national and industry standards for the producer services industry still contain certain issues, such as the limitation of current technical indicators and applicable technical scenarios, the lack of advanced scientific and technological achievements converted into standards, and the need for improvement in the technical content of the standards. The problems mentioned above have affected the advanced and scientific standards of the producer services industry, which is against the implementation of the standards.

4.3 The implementation force of standards needs to be enhanced

Producer services industry standards are standards for service businesses conducted to maintain the continuity of the industrial production process, facilitate industrial and technological progress and industrial upgrade, enhance production efficiency, provide security services, and provide guidelines for R&D and other technical services for production activities. Producer services industry standards are different from technical product standards, such as agriculture and manufacturing standards. They include technical, service and management standards and have a stronger impact and influence. For instance, transportation industry standards involve managing transportation, technology, products, and operations. The standardization system in the production service industry has significant problems, such as difficulty tracking and evaluation during the implementation process. An effective system to implement, monitor, and evaluate production service industry standards has not yet been developed.

4.4 The standards globalization needs to be further strengthened

The existing producer services industry standardization system attaches great importance to domestic applications. However, it ignores the process of internationalization, which is not conducive to the coordinated domestic and international development of standards. Taking postal, finance, transportation, and other fields as examples, China has developed a series of national and industry standards that have promoted standardization in related fields. However, the volume of international standards for the service industry in China is small. Participation in the TCs, sub-technical committees, and regional standardization organizations of the ISO, International Electrotechnical Commission, and International Telecommunication Union is inadequate.

5 The path of development of the standardization system for the producer services industry

5.1 The development target

Currently, the producer service industry in China is growing rapidly. Standards have an increasingly extraordinary influence on regulating public living services, which strongly leads to applying new formats, technologies, and models. In order to meet national development needs, it might be necessary to strengthen the main field in the producer services industry overall arrangement, push forward the service lifecycle management, provide support to the identical development, strengthen the service standards' international tracking and analysis, promote the transformation of China from a passive side to a market leader, and support the trade in services construction to become a great nation.

By 2025, China should focus on industrial upgrading demand and promote productive service industries, such as e-commerce, supply chain management, intellectual property services, business services, and information

technology services, to develop toward specialization and the high end of the value chain. This supports the high quality of the productive services industry development and forms a mechanism and model for research, promotion, and improvement of standards. The mechanism and model should be demand-oriented, enterprise-led, and jointly promoted by the government, enterprises, universities, research institutes, and application.

By 2035, the goal is to comprehend the producer services industry standardization system, strengthen the linkage between international and domestic standardization systems, strengthen the development of the digital economy plan, and advance modern logistics with supply chains, financial industry, human resource services, digital economy services, and other intelligent, modular, and standardized productive services. Cross-penetration, interaction, and cross-border integration of industrial ecosystems can be successfully built.

5.2 Key developmental directions

First, to build the Chinese service brand and a powerful producer services industry country, it is necessary to build a high-quality, efficient, and competitive producer services industry; speed up its standards system development schedule; focus on establishing and improving the standards system of the key sectors; make full use of the standards leading function; speed up the innovation of the producer services industry; enhance competition; improve the efficiency of the producer services industry; and strengthen the sustainable development capacity.

The next critical developmental direction is to promote the specialized service industry system and extend it to a high-end value chain. Furthermore, we need to focus on modern logistics and supply chains, public procurement and sustainable procurement, current financial systems, modern integrated transportation systems, commerce, logistics, credit management, human resource services, science and technology services, manufacturing services, high-tech services, and the establishment of business service standards.

Third, we can accelerate the formulation of standards regarding relevant research and application of new technologies in the productive services field, such as AI, life sciences, IoT, and blockchain. The plan is to promote the innovation and development of standards in the platform economy, sharing economy, experience economy, intelligent service, and high-quality service. This will foster service standards for innovative modes, such as manufacturing services and personalized customization, and establish a cross-penetration, interactive, and cross-border service ecology.

5.3 Different ways of implementation

Building a standardization system for high-quality producer services offers essential technical support to modern service industries, empowering them to grow rapidly and healthily and move up to the high end of the value chain. There are various ways to meet the demand for development plans between 2025 and 2035 and enrich the standards system.

The first is to improve the top-level design of the standardization system for the producer services industry. We assume the joint conference system for the standardization of the service industry to be a foundation by connecting relevant management departments of the service industry through national standardization administration departments. According to the high-quality requirements of the service industry, it is necessary to adhere to the working ideas of the overall design of the producer service standards system. By collaborating to promote standardization in key areas, formulating action plans, drafting policy documents and policies for producer service standardization, and mobilizing the enthusiasm of social groups and enterprises, a new, high-quality, and efficient modern service industry system will be constructed.

Second, it is necessary to strengthen the layout of the crucial areas of the producer service industry standards. We assume the high standards as a guide in using the new technology, a new model of big data, a hybrid cloud, machine learning, intelligent mobile Internet, IoT, and intellectual consulting as effective support under the foundation of traditional producer services standardization. It is also necessary to focus on the digital and intelligent requirements of producer service standards systems under new eras and different business types, laying out technology committees in key areas, and systematically formulating national and group standards. Eventually, it offers the public a producer services industry standardization with systematically distributed, comprehensively arranged, and collectively promoted working pattern forms.

The third is to promote the pilot promotion and supervision of standards for producer services. Producer service standards are mostly management and service standards, which are different from product standards and challenge the implementation and surveillance of standards. Pilot work standardization should be constantly promoted to improve the application of the related standards in the producer services industry and strengthen the evaluation and

supervision of management and service standards throughout the application process. Enterprises can publish self-declarations and high-quality service commitments to implement management and service standards.

The fourth is to promote the internationalization of producer service standards actively. The import and export of standards should be combined. The current status of key areas, international standardization potentials, and critical breakthrough directions of China's producer services should be summarized and studied, thus proposing strategic tasks and essential measures for globalizing China's producer services standards. By establishing a producer service standards globalization base and mobilizing enterprises to participate, the development directions and key contents for China's critical service sectors such as health, logistics, and finance will be determined.

6 Countermeasures and suggestions

6.1 Improving the standardization system of the producer services industry in the new era

Based on sorting out the development of producer services in China, requirements for the internationalization of standards, and key breakthrough directions through proper arrangement, a new standards system that can adapt to the high-quality development of producer services, advance, be effective, and stand against the application practice of the market needs to be established. The standardization management department and the department in charge of related businesses are required to enhance cooperation in formulating strategic planning, international action plans, and detailed rules in the fields of aging, finance, science and technology innovation service, digital economy, and other key services, including staged strategic tasks for 2025 and 2035, formulation and revision of government standards, proposals about formulating and revising domestic and foreign standards, tracking and conversion of international standards, and establishment of technical committees, sub-technical committees, or working groups.

6.2 Increasing the adequate supply of emerging service business standards

Government-led standards and independent market-oriented standards may need to be coordinated. It is necessary to focus on the key service areas, encourage the active participation of stakeholders, and combine the knowledge of professionals with the development needs of the service market. Targeting new business types (such as digital economy, platform economy, and sharing economy) brought by new technology, including big data, cloud computing, IoT, AI, intelligent cities, and 5G, the standards for key areas (such as data security, privacy protection, and non-standard products trade) should be developed dynamically and creatively. The formulation and promotion of relative standards can be accelerated to meet the development requirements of China's social economy and lead international needs.

6.3 Promoting the systematic connection of standardization systems of producer services and other industries

Currently, the development of standards in the producer services industry is mostly based on market demand and industrial development. However, standardization systems are still not advanced. It needs systematic deployment, classification, and careful consideration to develop producer service standards conforming to different industries, fields, and objects in producer services. Regarding the strategic development plan of service standards for 2025 and 2035, the full-service lifecycle model should be considered as a support; the serving enterprises, consumers, and society should be regarded as an integrated piece, and the principles of voluntarism, fairness, equality, and consensus should be adhered to. It is recommended that the standardization system of producer services be connected with the standardization system of modern agriculture and advanced manufacturing and the internal standardization system of the services industry, thereby establishing a market-oriented standardization system that covers the entire lifecycle of producer services and integrates with other industries.

6.4 Consolidating the expert foundation

The development of the standards system for producer services cannot be separated from professional and high-quality talented persons. Talented workers are the primary driving forces and are key to business development. Talents in the producer services industry are inadequate, especially in the international service field. This shortage has also become a critical bottleneck in preventing international standardization in China's service fields. Thus, the paper suggests developing new programs or improving the current educational and teaching programs to cultivate talent for the standardization of higher education. In terms of cooperation between universities, the integration of industry, education, and research is needed to promote and assist the development of

national and international standards for effective services actively. Integrating scientific research and market practices into standards development can form a development mode integrating scientific research, management, and markets.

6.5 Accelerating the internationalization of standards

It is suggested that standardization needs to increase participation in regional organizations in the standardization service industry. China should activate its position and role in regional standardization organizations, including the Pacific standardization standards conference, the ASEAN standards and quality advisory committee, the European standardization committee, the standardization organization in Africa, and the Arab Standardization and Metrology Organization, promoting China's service industry standards to become regional standards. We should focus on 12 key areas in trade in services. The standards in advantageous areas in China should be globalized. Those in the disadvantageous fields should be improved by learning from advanced international experiences to strengthen the mutual recognition of standards and effectively guarantee the development of China's trade in services. A research base can be established for the internationalization of service standards, and the strength of standardization research institutions can be fully exerted. Enterprises can be encouraged to participate in international standardization work to contribute to Chinese wisdom and provide Chinese solutions.

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