

New Data Infrastructure Guidelines to Shape Digital Future

Policy

By YU Haoyuan

China launched a new phase in the development of its data-centric digital infrastructure by setting a target to build a national data infrastructure and operate it by 2029.

The national data infrastructure will provide a range of services from data collection to utilization, including transmission, processing, circulation and security. It will be built in national coordination and have regional, industry- and enterprise-level data facilities.

Vision and phased roadmap

The National Development and Reform Commission, the National Data Administration, and the Ministry of Industry and Information Technology have jointly issued a set of guidelines for constructing the national data infrastructure.

The vision for the future is "integrating massive amount of data, benefiting hundreds of businesses, and showing potential of the digital future."

To achieve this, the guidelines propose a phased approach:

- 2024 to 2026: Trials should be conducted on technical pathways, standards unified, and the top-level design finalized.
- 2027 to 2028: Infrastructure supporting large-scale data interconnection should be established, creating a system for cross-level, cross-region, cross-department, and cross-business data flow covering major cities.



Engineers check equipment in a data center in Gansu province, January 6. (PHOTO: XINHUA)

- By 2029: The national data infrastructure should be completed, forming an efficient, standardized data circulation system to support a robust technological and industrial ecosystem.

Enhancing data circulation and transmission

The guidelines emphasize the importance of creating a systematic data circulation environment that is credible, efficient, interconnected and secure. This will facilitate rapid and orderly data sharing between different organizations and industries, accurately matching supply and demand.

Special attention should be given to innovative applications in sectors like e-commerce, financial payments, and cross-border logistics, ensuring compliance with laws, ethics, and privacy protection.

Building high-speed data transmission networks is another key task. These networks will support critical scenarios such as digital finance, smart healthcare, transportation logistics, and large language model training.

In addition, transmission costs should be reduced, and data exchange performance should be enhanced.

Advancing network innovation and ecosystem growth

New computing resources should be concentrated at key national nodes and a platform should be established to monitor and coordinate the computing network. A collaborative strategy will redistribute non-low-latency services from the eastern to the western regions, optimizing resource allocation and reducing costs.

China also plans to upgrade its 5G network to the 5G-A level and accelerate research and innovation in 6G technology. The 5G-A network has faster speed, lower latency, greater connectivity, and reduced energy consumption. It will have a peak download rate of 10 gigabits per second and upload speed of one gigabit per second, along with millisecond-level latency and low-cost Internet of Things connectivity.

Attracting more investment

Besides setting clear goals and implementation paths, the guidelines also highlight the dual role of the government and market, encouraging bold innovation and technology application. This will lay the foundation for a high-speed, open, inclusive, and secure national data infrastructure.

According to preliminary estimates from the industry, data infrastructure will attract direct investments of approximately 400 billion RMB annually, driving an investment scale of about two trillion RMB over the next five years.

To advance this transformative initiative, the relevant departments will coordinate efforts to ensure that policy, technology, standardization, and talent resources are in place.

Case Study

Beijing's Blueprint to Be STI Hub

By Staff Reporters

Beijing has launched a comprehensive action plan to strengthen its position as a world-class science, technology, and innovation (STI) hub by 2027. The initiative, led by the Beijing Municipal Science and Technology Commission, focuses on enhancing international cooperation and fostering global innovation.

The plan outlines key measures such as establishing bilateral and multi-lateral cooperation frameworks, encouraging enterprises to co-develop international laboratories, and supporting companies in expanding their operations overseas.

To facilitate high-level openness, the plan prioritizes innovative cooperation models, focusing on attracting global innovators to Beijing while helping local enterprises expand internationally.

For example, it proposes an "incentive plan for foreign investment R&D" to draw more foreign R&D centers to the city and offers increased support for domestic companies to integrate resources from both domestic and international markets for innovation.

The plan will be executed with a market-oriented approach, with enterprises playing a leading role in STI efforts. It also highlights the importance of international organizations, foreign business associations, and foreign-funded R&D centers in fostering a high-level innovation ecosystem through collaborative efforts.

Six priorities have been outlined to advance Beijing's development as a global STI center:

Expanding international science cooperation networks: Strengthening exchange mechanisms, deepening "Belt and Road" innovation collaboration, and attracting international sci-tech organizations to Beijing.

Enhancing international cooperation

platforms: Improving the competitiveness of the "Three Science Cities and One Demonstration Area" (Zhongguancun Science City, Huairou Science City, Beijing Future Science Park, and the Demonstration Area for Innovation-based Industrial Clusters), unlocking the potential of sub-parks, and developing international innovation clusters like the Beijing China-Japan Innovation and Cooperation Demonstration Zone and the Beijing China-Germany Industrial Park.

Optimizing cooperation platforms: Advancing recognition systems for international science bases, supporting cross-border technology transfer agencies, and promoting open sharing of major scientific facilities.

Boosting collaboration among innovation entities: Encouraging international exchanges in fundamental sciences, joint research on cutting-edge technologies, and partnerships in applied technology development.

Building a world-class open innovation ecosystem: Refining intellectual property systems, enhancing international talent services, strengthening financial mechanisms, and fostering policy innovation.

Promoting science exchanges and collaboration: Hosting a high-standard Zhongguancun Forum, organizing influential academic events, and bringing out prestigious scientific journals.

By 2027, Beijing aims to establish itself as a world-class international STI center, with significant advancements in talent, technology, and capital flows. Key targets include establishing 15 Belt and Road joint laboratories, initiating 100 international joint research projects, and attracting 300 foreign-funded R&D centers.

Also on the agenda is publishing 120 top-tier scientific journals and ensuring that the Zhongguancun Forum gains substantial global influence.



Beijing cityscape. (PHOTO: VCG)

Digital Transformation of Manufacturing Sector Pushed

By CHEN Chunyou & CUI Shuang

Digital transformation of China's manufacturing sector is in the spotlight, after a recent guideline was jointly issued by the Ministry of Industry and Information Technology (MIIT), the State-owned Assets Supervision and Administration Commission and the All-China Federation of Industry and Commerce.

This initiative seeks to accelerate the widespread application of next-generation information technologies across all industrial processes and supply chains, reshape business models and organizational structures, and enhance the overall digitalization level of manufacturing enterprises.

According to MIIT, the digital transformation of China's manufacturing industry has progressed from conceptual discussions to large-scale implementation. The guideline aims to address challenges, such as unclear transformation demands and uncertain

implementation pathways, by clarifying transformation strategies and strengthening the support systems.

Scenario-based solutions

By mapping out digital transformation scenarios for key industrial chains and sectors, the guideline identifies the demands for industrial data elements, knowledge models, tools and skills in each scenario, helping enterprises clarify their transformation goals and assess the potential benefits of various scenarios.

Focusing on core business processes, the guideline proposed six measures to accelerate transformation, including strengthening cloud-based R&D and design collaboration, promoting intelligent transformation of production processes, accelerating innovation in operation and maintenance service models, optimizing business management processes, enhancing supply chain resilience and flexibility, and exploring cross-scenario integration and optimization.

For instance, enterprises are encouraged to adopt generative AI technologies in customer management and after-sales services to reduce costs and improve efficiency. Meanwhile, they are urged to develop AI-enhanced R&D tools, such as generative design software and real-time simulation applications, to accelerate product innovation.

Differentiated transformation strategies

The guideline categorizes enterprises into three groups based on their scale and digitalized levels — industry leaders, large enterprises, and small and medium-sized enterprises (SMEs).

These industry enterprises, which have strong digital foundations, are required to focus on improving supply chain integration and industry collaboration to solidify their market dominance.

SMEs, whose digital foundations are weak, are expected to adopt tailored approaches focusing on high-impact areas and achievable goals. Specialized

SMEs can explore more advanced scenarios such as digital twins and integrated design-manufacturing systems.

As for large enterprises, they should develop holistic transformation strategies, and build industrial internet platforms to integrate digital capabilities across all processes and scenarios to achieve data-driven decision-making and optimization.

Data-driven transformation is another priority. Leading enterprises are encouraged to build industrial data corpus to support AI training and unlock the latent value of industrial data.

Efforts will focus on mobilizing financial institutions to develop innovative financial products and services that support digital transformation. The government plans to establish a comprehensive standardization framework for manufacturing digitalization, promote the adoption of national standards, and foster a unified approach to digital transformation across the sector, said MIIT.

Hebi Enters Commercial Aerospace Arena

By ZHONG Jianli & SUN Yue

Four satellites were launched from China's Taiyuan Satellite Launch Center in December, 2024, bringing the total number of operational satellites in the country's largest commercial radar remote sensing constellation, known as the Nüwa Constellation, to 12.

The 12 satellites are now continuously transmitting data from an altitude of over 500 km to the satellite operations center in Hebi city, Henan province. This data is essential for staff analysis and research, providing swift and high-quality monitoring services for urban development.

From R&D to manufacturing, operation, and innovative applications, Hebi is establishing a comprehensive "aerial

and terrestrial" commercial aerospace industrial cluster.

Once labeled as a resource-based city, it is now aligning itself with high-quality growth by focusing on the development of the satellites, rockets, data, and services industrial chain.

"We have currently launched 12 satellites and plan to network a total of 114 satellites in the Nüwa Constellation by 2027," said Wang Yuxiang, chairman of PIESAT, a commercial satellite company.

As a fast-evolving, economically beneficial, and highly synergistic new industry, commercial aerospace is a critical growth driver for China's economy and offers vital support for the nation's transition to a strong aerospace country.

To accelerate its digital transformation strategy and seize opportunities in

satellite and application development, Hebi has established an initial satellite industry fund of 400 million RMB, attracting nearly four billion RMB in social investment. This funding primarily supports the development of satellite manufacturing, launching and applications, facilitating the rapid networking of the Nüwa Constellation and capturing strategic advantages in the satellite industry.

Now, the city has established a comprehensive commercial aerospace industrial chain encompassing satellite design, R&D, assembly and testing, rocket R&D, manufacturing and launching, and satellite data applications.

Nearly 40 commercial aerospace upstream and downstream enterprises have settled in the city's satellite manu-

facturing industrial park, creating a cluster effect driven by leading companies that attract others to Hebi.

The aerospace science education base is also a highlight of the satellite manufacturing industrial park, where visitors can observe a replica of the Tianhe core module of China's space station Tiangong, the space simulator, and the 3D aerospace cinema. These exhibits have attracted numerous students for research and learning.

Huang Chao, general manager of the education base, said, "This is an aerospace science education base that integrates immersive scene tours, aerospace mission experiences, and aerospace engineering education. It is also a part of Hebi's larger goal of building a robust aerospace industry."