

AI Powers Shipping Industry's Action Plan

Policy Express

By TANG Zhexiao

China has rolled out an action plan to accelerate the deep integration of cutting-edge technologies, such as artificial intelligence, into the shipping industry and foster the growth of new quality productive forces in the shipping sector.

The plan, jointly issued by the Ministry of Transport, the Ministry of Industry and Information Technology, the State-owned Assets Supervision and Administration Commission of the State Council and the State Administration for Market Regulation, outlines the general requirements, key tasks, and support measures for intelligent shipping development during the 15th Five-Year Plan period (2026-2030).

The plan lays out a two-phase development roadmap with clear targets:

By 2027, China aims to achieve deep integration of AI and the shipping sector, make breakthroughs in key technologies, establish over three comprehensive intelligent shipping pilot zones and more than five pilot routes, and put more than 100 intelligent ships into commercial operation.



The vessel SMC Rizhao departs from a berth at Qingdao Port, Shandong province. (PHOTO: XINHUA)

By 2030, the country is expected to fully incorporate core technologies, form a new coordinated development model covering technology, industry, and governance, and elevate China's intelligent shipping development to an internationally advanced level.

Industry insiders believe the release of the plan marks a new stage of systematic advancement in China's intelligent shipping sector. It not only provides systematic solutions to the bottle-

necks hindering development but also offers strong momentum and solid support for building China into a transportation powerhouse by 2035. Furthermore, it will enable China's shipping industry to transition from "keeping pace" to "taking the lead" in the global wave of intelligent transformation.

To achieve its goals, the plan systematically deploys 11 key tasks across four areas: technological equipment breakthroughs, empowering application

pilots, upgrading infrastructure, and enhancing regulatory governance.

In the future, regions such as the Yangtze River Delta, the Pinglu Canal, and the Beijing-Hangzhou Grand Canal will be selected for the key tasks, as well as typical transportation routes including north-south coastal routes and inland waterway network routes, according to Chen Deli, deputy director-general of the Maritime Safety Administration of the Ministry of Transport. Chen added that a batch of comprehensive pilot zones, pilot routes, and pilot ships will also be designated for remote control and autonomous navigation applications, to promote the large-scale development of intelligent shipping.

Currently, there are 60 automated ports in China, with the country maintaining a global lead in smart port construction. In addition, construction of smart waterways is accelerating, with national electronic navigational charts coverage now exceeding 10,000 kilometers.

Meanwhile, the application of blockchain technology in port electronic cargo release and maritime electronic bills of lading is continuously expanding, laying a strong foundation for the future development of intelligent shipping.



Case Study

Nanjing's Solution-driven Innovation Practice

By TANG Zhexiao, ZHANG Ye & HU Zeyan

Nanjing achieved two milestones in 2025: its software business revenue topped one trillion RMB for the first time with a 16.7 percent year-on-year growth, and it secured 5th place nationwide in innovation capacity, according to official data from the Ministry of Industry and Information Technology and the Ministry of Science and Technology.

From biomedicine to intelligent manufacturing, and from addressing industrial bottlenecks to meeting people's livelihood needs, innovative achievements in the capital of east China's Jiangsu province are continuously being put into practice to solve practical problems, "weaving" a symbiotic network connecting talent, universities, enterprises, and the government through solution-oriented innovation.

Breaking innovation constraints

Nitric oxide is widely used in the clinical treatment of various cardiopulmonary diseases in newborns, children and adults, serving as a crucial therapeutic tool. However, its storage and transport rely mostly on bulky, risky and highly inconvenient traditional steel cylinders.

A Nanjing-based biotechnology company targeted this urgent clinical demand and set up an R&D program. After years of research, the world's first portable nitric oxide therapeutic device, based on electrochemical catalysis, was developed in Nanjing, opening a convenient facility for patients in need.

Another biotech enterprise, Nanjing Leads Biolabs Co., Ltd., focuses on oncology and autoimmune diseases. Its independently developed Opamistomig (LBL-024) is the world's first 4-1BB-targeted drug to enter pivotal clinical trials. Opamistomig is a uniquely engineered bispecific antibody which has the potential to deliver more potent and durable anti-tumor activity particularly in difficult-to-treat and immunotherapy-resistant tumors. On March 6, the company announced that the first patient had been successfully dosed in a Phase II clinical study evaluating Opamistomig.

Targeted policy support has provided a strong impetus for industrial, scientific and technological innovation. Besides establishing an office for promoting such breakthroughs, Nanjing



has issued several policies on accelerating the cultivation of new quality productive forces and promoting high-quality development in 2026, rolling out a series of special measures for the biomedical industry.

Currently, Nanjing's biomedical industry has formed a full-cycle ecosystem covering basic research, clinical trials and industrialization. In 2025, the annual operating revenue of the city's biomedical industry exceeded 225 billion RMB.

Supporting intelligent upgrading

In the workshop of an intelligent manufacturing company in Nanjing, a collaborative robot performs welding operations with a repeat positioning accuracy of ± 0.02 millimeters. By parameterizing and software-encoding the skills and experience of veteran welders, the collaborative welding robot can effectively replicate skilled labor tasks and iterable digital process packages, solving any shortage of trained workers.

To address industry-wide challenges such as rising labor costs and an aging workforce, intelligent harvesting robots, equipped with vision and large language models, can identify ripe fruit in complex branch and leaf environments, with a single-arm picking cycle of about five to eight seconds, providing intelligent solutions for agricultural production.

In recent years, using the symbiotic network of government, enterprises, universities, research institutes and capital, Nanjing has championed the shift of artificial intelligence from technological concepts to industrial application.

An action plan promoting the innovative development of AI, along with several policies formulated to accelerate the industrial application of large models, aims to develop industrial application large models and build more than 20 application scenarios.

The revenue of the city's intelligent manufacturing equipment industry exceeded 300 billion RMB in 2025, a year-on-year increase of about six percent. This has seen the software and information service industry incorporating more than 3,600 key software-related enterprises, forming a complete industrial chain.

Nanjing's AI products and services now cover all links of the industrial chain, including the basic layer, technology layer and application layer.



The AI Mirror World — Nanjing Artificial Intelligence Ecological Street in Yuhatai District. (PHOTO: XINHUA)

Guidelines to Advance High-quality E-commerce Development

By LI Linxu

To better serve the real economy, China has rolled out a policy document to advance high-quality development of the e-commerce sector.

The document was jointly released by six government bodies, including the Ministry of Commerce (MOFCOM), the Ministry of Industry and Information Technology, and the Ministry of Agriculture and Rural Affairs.

In recent years, China's e-commerce sector has experienced robust growth, maintaining its position as the world's largest online retail market for 13 consecutive years, according to an official from MOFCOM.

Currently, it covers 26 million domestic businesses and serves 3.2 billion consumers worldwide. The accelerating integration of online and offline channels has played an increasingly prominent role in driving the high-quality development of the real economy.

The document outlines a series of guidelines to deepen the integration of the digital and real economies, empowering small and medium-sized enterprises and rural areas through e-commerce, and cultivating industrial e-commerce.

More efforts will be made to accelerate the application of technological innovation, develop quality consumption,

and build integration platforms, so as to achieve a higher-level dynamic balance between supply and demand.

In 2025, the R&D intensity of major e-commerce platforms exceeded eight percent. China's revenue from cloud computing and big data services grew by 13.6 percent, emerging as a new engine for cultivating new quality productive forces, according to the official.

The policy urges promoting high-standard opening up by advancing cross-border e-commerce and expanding the Silk Road e-commerce initiative, while accelerating institutional opening up and pushing for greater alignment with international rules in areas such as

digital trade.

To date, China has established Silk Road E-Commerce partnerships with 36 countries, with cross-border e-commerce accounting for more than six percent of the total foreign trade in goods.

To foster a sound ecosystem, it also highlights efforts to clarify the responsibilities of platforms, enhance regulation, and guide compliant overseas expansion.

The document also puts forward a series of support measures, including optimizing the supply of financial products, unlocking the value of data elements, and strengthening targeted talent cultivation.



Digital Human Information Services Regulated

By TANG Zhexiao

China's cyberspace regulator has released a draft regulation to strengthen oversight of digital human services, and is now soliciting public opinion.

The Cyberspace Administration of China announced the draft, which is open for public comment until May 6. It aims to foster healthy development and standardized application of digital human information services.

The draft defines digital humans as virtual digital figures that exist in non-physical environments, employ technologies including graphics, digital image processing and artificial intelligence, simulate human appearance through re-

al-human or algorithm driving modes, and feature voice, behavior, interaction capability and personality.

It stipulates that no organization or individual may use digital humans with identifiable traits of specific natural persons without their consent, or use digital human services to infringe upon others' personality rights in any form such as defamation or insult.

Notably, the draft prohibits inducing minors to become addicted to digital humans through virtual services. It bans offering virtual intimate relationships such as virtual relatives or partners to minors, as well as services that encourage excessive consumption, promote religious indoctrination, or contain content

that may cause or encourage minors to imitate unsafe behaviors.

Any organization or individual that uses an individual's sensitive personal information for modeling, image generation or scenario construction must obtain that the person's explicit informed consent, and disclose relevant details truthfully, accurately and completely in a prominent and easily understandable manner.

From the commencement of digital human services, the document requires service providers offering interactive digital human services (including voice chat) to display a prominent "digital human" label continuously alongside related content.

Huang Yongfeng, an expert and researcher at Zhongguancun Laboratory, said the draft provides important institutional support for high-quality development of the digital economy and building China's cyber strength.

"From a national perspective, it improves the institutional system for cyberspace security governance. For the industry, it sets clear compliance boundaries for the digital human sector and safeguards technological innovation. Globally, it offers a Chinese solution for digital virtual human governance and advances the building of a community with a shared future in cyberspace," Huang said.



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HEPS: Super Microscope for Micro World

The perimeter of HEPS's accelerator is 1.36 kilometers, and the area within the circle is as large as 20 football fields, Dong said. The high energy electron beam, which can accelerate to six billion electron volts and travel at a speed close to that of light, radiates a synchrotron light source.

To help the electron beams travel more steadily and generate brighter light, the research team tackled a series of world-class technological challenges.

They implemented a world-first recirculating in-axis replacement injection scheme, enabling stable operation of a single-beam group with high charge den-

sity. They also innovatively adopted a 48-cell hybrid seven-bend achromat magnetic focusing structure.

"By increasing the number of bending magnets and optimizing their layout, we have reduced the natural emittance of the electron beam to below 60 pm·rad," said Dong.

"A picometer describes the transverse size of the electron beam, while a radian refers to its divergence angle during motion. The smaller the product of the two, the more tightly the

beam remains focused at high speed, with less spread," Dong explained. "This value means that the electrons maintain a compact 'formation' as they travel, with a divergence of only a few micrometers."

The R&D team has overcome several other key core technological challenges. For example, small-aperture magnet technology has reduced the magnet aperture to approximately 25 millimeters, resulting in a magnetic field gradient four times that of third-generation light

sources, thereby enabling more precise control of the electron beam.

Trial operation beyond expectation

On October 29, 2025, HEPS passed the technical acceptance inspection organized by CAS, and began trial operation in December. Now, the facility operates in an alternating cycle of "user trials + performance optimization."

The research covers cutting-edge fields such as defect and fatigue assessment of aerospace components, in-situ studies of power battery charging and

discharging, ultrafast 3D printing processes, brain and organ imaging and semiconductor testing.

In the aerospace sector, HEPS utilizes its high penetration capability to detect defects in aerospace components at deeper levels, thereby contributing to aerospace safety; in life sciences, it advances brain research by characterizing neuronal networks in primate brains.

"User feedback indicates that the trial results have far exceeded expectations. Some samples that cannot be ob-

served clearly by other light sources can be distinguished by HEPS," Li Gang, researcher at IHEP, said. While advancing the facility towards acceptance after meeting performance targets, the research team is also actively communicating with research institutes and leading enterprises to address their critical needs, Li said.

"We plan to add several new beamlines and supporting accelerator equipment to further enhance our user service capabilities," Pan said, adding that the next-generation light source is expected to reduce the beam divergence to the diffraction limit, truly enabling scientists to "see every atom."