科技日报

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Science and Technology Daily

China's Economic Growth Catalyzed by Sci-tech

By LU Zijian

China's annual Central Economic Work Conference was held in Beijing from December 11 to 12, setting the economic agenda for next year. In 2024, China's economy has shown resilience and maintained stable growth despite the complicated environment, and science, technology and innovation have played a crucial role in this growth.

The sales revenue of high-tech industries increased by 11.4 percent year on year from January to October, according to data from the State Taxation Administration. In particular, the sales revenue of technology transfer services and information technology services surged by 27 percent and 12.3 percent year on year respectively, reflecting the acceleration of the process of innovation transfer and informatization.
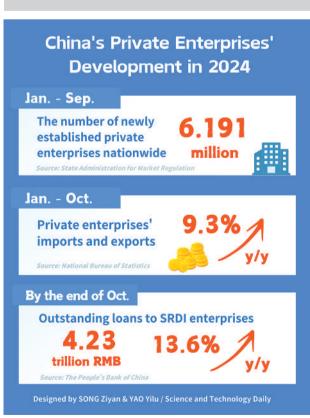
Digital industrialization progressed steadily, with the core industries of the digital economy growing their sales revenue by 7.4 percent year on year. The sales revenue of the digital technology application industry and digital content and media rose by 11 percent and 14.8 percent year on year respectively.

The high-tech manufacturing industry also displayed vitality. The sales revenue of equipment, digital products and high-tech manufacturing industries went up by 5.3 percent, 8.5 percent and 8.7 percent year on year respectively. Computer, communications and radar equipment, and intelligent equipment industries all expanded their sales revenue by two digits.

According to the National Bureau of Statistics of China, the added value of equipment manufacturing industry grew by 7.5 percent year on year, and that of high-tech manufacturing industry by 9.1 percent in the first three quarters. The production of new energy vehicles, integrated circuits and 3D printing devices escalated by 33.8 percent, 26 percent and 25.4 percent year on year respectively. Moreover, the added value of information transmission, software and information technology services witnessed an 11.3-percent growth.

In terms of high-tech industry investment, which increased by 10 percent compared with last year, investment in high-tech manufacturing and high-tech services grew by 9.4 percent and 11.4 percent respectively. Investment in manufacturing aerospace vehicles and equipment and manufacturing electronic and communication equipment grew by 34.1 percent and 10.3 percent respectively.
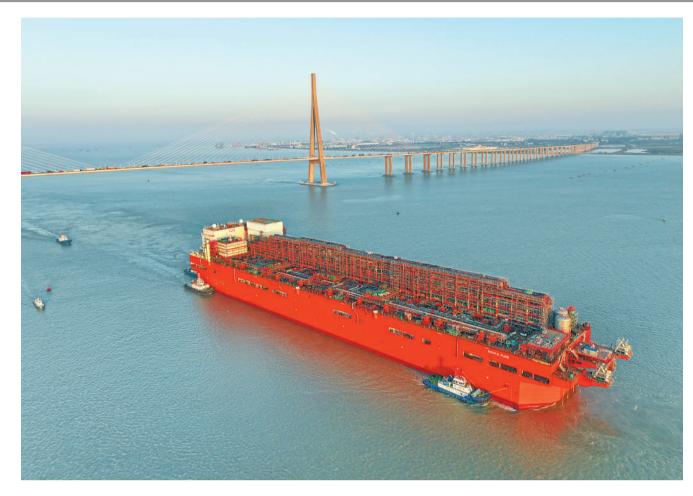
New Graphic

China's Private Enterprises' Development in 2024

Jan. - Sep.
The number of newly established private enterprises nationwide
6.191 million
Source: State Administration for Market Regulation

Jan. - Oct.
Private enterprises' imports and exports
9.3% y/y
Source: National Bureau of Statistics

By the end of Oct.
Outstanding loans to SRDI enterprises
4.23 trillion RMB **13.6%** y/y
Source: The People's Bank of China

Designed by SONG Ziyan & YAO Yilu / Science and Technology Daily

WECHAT ACCOUNT   E-PAPER

The "NGUYA FLNG," a floating liquified natural gas (FLNG) facility, is tugged through the Sutong (Suzhou-Nantong) Bridge across the Yangtze River in east China's Jiangsu province, December 9, 2024. (PHOTO: XINHUA)

Editor's Pick

HarmonyOS to Redefine Mobile Operating Systems

By LIN Yuchen

In November, Huawei officially launched its Mate 70 smartphone series powered by its proprietary operating system (OS) HarmonyOS NEXT, which became the third major global mobile operating system alongside Apple's iOS and Android.

HarmonyOS, China's first fully self-developed mobile OS, represents over a decade of innovation and resilience.

An idea is born

The project traces its roots to 2012, when Huawei founder Ren Zhengfei, inspired by the apocalyptic film *2012*, envisioned a "Noah's Ark" for the digital flood ahead. This idea led to the establishment of Huawei's 2012 Labs, where foundational research for a future operating system began.

HarmonyOS was introduced at Huawei's Developer Conference that year.

The system's architecture was revolutionary, enabling seamless connectivity across devices — from smartphones and tablets to wearables, cars, and industrial machines.

At its core, HarmonyOS utilizes a distributed computing framework, enabling developers to create applications that could operate across diverse hardware platforms. This innovation positioned HarmonyOS as more than a mobile OS; it became a universal operating system designed for the Internet of Everything.

Becoming a thriving ecosystem

Developing HarmonyOS was not without its challenges. Initially, the system retained some compatibility with Android's open-source codebase, but Huawei soon transitioned to a fully self-developed "Harmony Kernel." This helped the company to achieve greater independence in areas like data security, privacy and system performance.

Key to the system's success is its robust privacy framework. HarmonyOS introduced groundbreaking measures, such as limiting apps' access to sensitive data and denying permission for unnecessary operations like reading installed app lists. The focus on user protection helped HarmonyOS establish itself as a secure alternative to its competitors.

However, technology was only one side of the coin; building a viable ecosystem posed an even greater challenge.

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Spring Festival on UNESCO Intangible Cultural Heritage List

By LIN Yuchen

On December 4, China's Spring Festival was inscribed on UNESCO's Representative List of the Intangible Cultural Heritage of Humanity. The 19th session of the Intergovernmental Committee for the Safeguarding of Intangible Cultural Heritage gave the nod to China's nomination of the "Spring Festival: Social Practices of the Chinese People in Celebration of the Traditional New Year."

The Spring Festival is China's most profound and richly celebrated traditional festival. For thousands of years, it has embodied the Chinese people's deep familial and national sentiments, reflecting values such as harmony between humans and nature, and peaceful coexistence among individuals. The festival plays a vital role in fostering family bonds, promoting social harmony, and contributing to

economic development. As its global presence continues to expand, the Spring Festival has become a universally recognized symbol of Chinese culture.

On December 5, the session also approved the transfer of three Chinese cultural heritage projects from the List of Intangible Cultural Heritage in Need of Urgent Safeguarding to the Representative List of the Intangible Cultural Heritage of Humanity. These are the Traditional Li Textile Techniques: Spinning, Dyeing, Weaving and Embroidering, the Qiang New Year, and the Traditional Chinese Wooden Arch Bridges Construction Techniques.

These heritage projects have seen remarkable progress in preservation and sustainability. Traditional Li textile making and embroidery, still done by women of Li ethnicity in Hainan province, has spurred local economic development by

creating employment opportunities for women through cooperatives and enterprises.

The Qiang New Year, a festival celebrated by the Qiang ethnic group, has contributed to the protection of traditional Qiang culture while boosting cultural tourism.

The traditional Chinese wooden arch bridge construction techniques, prevalent in parts of Fujian and Zhejiang provinces, represent a harmonious integration of intangible cultural heritage with natural and cultural ecosystems.

This marks the first successful application of the UNESCO mechanism for transferring items between lists under the framework of the 2003 Convention for the Safeguarding of Intangible Cultural Heritage. It reflects China's effective work in heritage preservation and offers valuable lessons for other nations.

Tech and Solidarity Revive Notre-Dame

International Cooperation

By LI Hongce & WANG Xiaoxia

A grand ceremony on December 7 marked the reopening of the Notre-Dame Cathedral in Paris after a devastating fire in 2019. Technology played a crucial role in the restoration of the 12th-century cathedral.

The French government started the restoration in September 2019, with archaeologists, historians, anthropologists, physicists, chemists, engineers and computer scientists worldwide contributing their knowledge and skills.

A virtual avatar of the Notre-Dame has been developed. It is a 3D digital system that collects data and information related to the cathedral, laying a foundation for subsequent restoration projects.

To restore and maintain the original acoustics of Notre-Dame, scientists collected acoustic models of the cathedral after the fire, and compared them with geometric acoustic models from 2015. Accordingly, they suggested what kinds of materials to choose for the restoration.

The work was not only a top priority in France, but also received global support and donations. China was the first country to reach an intergovernmental agreement with France on the restoration of the iconic cathedral.

The cultural heritage management authorities of China and France exchanged letters to discuss how they could cooperate.

In November 2019, China and France issued a joint statement on cooperation in the field of cultural heritage, including Notre-Dame and China's legendary Terracotta Warriors and Horses, described as the "most significant archaeological excavations of the 20th century."

In April 2023, a joint statement by the two countries reiterated the commitment to strengthening bilateral cooperation in the protection, restoration and development of cultural heritage.

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WEEKLY REVIEW

Chinese Scientists on Nature's 10 List
The 2024 *Nature*'s 10, an annual list of 10 people who helped shape science, was released on December 9. Two Chinese scientists are on it. Li Chunlai, deputy chief designer for China's Chang'e-6 mission, received the first samples from the far side of the Moon. Xu Huji is a physician at the Naval Medical University. *Nature* calls Xu a "daring doctor behind a world-first treatment for autoimmune disease."

Landmark Human Evolution Fossils Found
Chinese researchers have found human fossils dating back 300,000 years, the earliest found in East Asia related to the human evolutionary process. The human fossils, along with a large number of fossilized animal bones and stone tools, were unearthed at the Hualongdong site in east China's Anhui province.

Pan-genome of Rice Mapped
Chinese researchers have released nearly complete genomes for 13 representative wild rice species and constructed an ultra pan-genome map. They discovered 63,881 new gene families in cultivated rice, increasing the number of available rice genes by 1.7 times.

First Carbon-14 Diamond Battery Created
British scientists have created the world's first carbon-14 diamond battery. This new type of battery has the potential to power devices for thousands of years, making it an incredibly long-lasting energy source.

Research Throws Light on Largest Black Holes
Australian researchers have created the most detailed gravitational wave maps to date, developed the largest galactic-scale detector, and found more evidence of a gravitational wave background. Their studies offer new insights into the universe's largest black holes.