

China's New Industrialization and Smart City Construction

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(1)

The Fourth Industrial Revolution and Its Impact on China

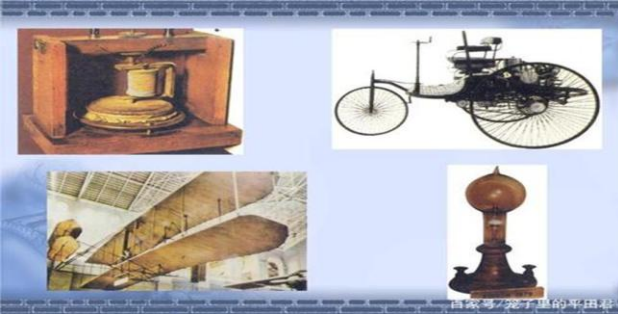
the fourth industrial revolution

Background Introduction



The Industrial Revolution

In the mid-1760s, Britain initiated the "Steam Age";



The Recond Industrial Revolution

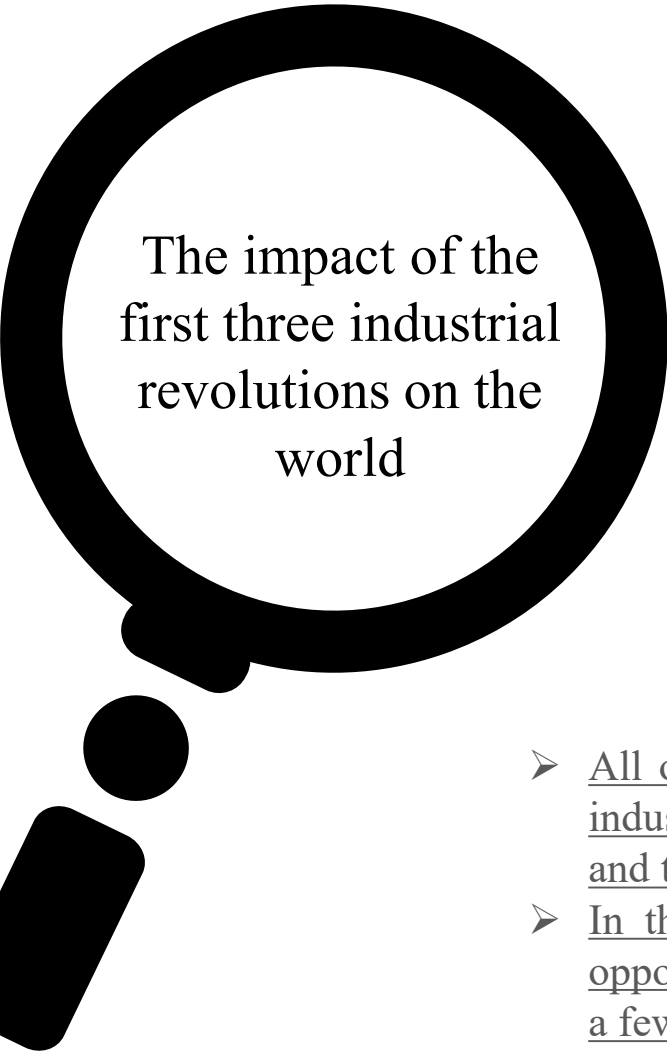
In the mid-19th century, European countries, the United States and Japan experienced the “Electrical Age”;



The Third Industrial Revolution

Since the 1940s and 1950s; “The Information Age”;

The impact of the first three industrial revolutions on the world



The impact of the first three industrial revolutions on the world

1

All of these have greatly promoted the development of social productivity and brought about new changes in industrial layout.

All of them caused significant changes in social relations: for the first time, they led to the emergence of two opposing classes in modern society, namely the industrial proletariat and the bourgeoisie, and began the process of urbanization. The second time, monopolistic organizations emerged and merged with the state power. The transition from free capitalism to monopoly capitalism. The third time, the strengthening of state monopoly capitalism has led to an increase in the proportion of the tertiary industry.

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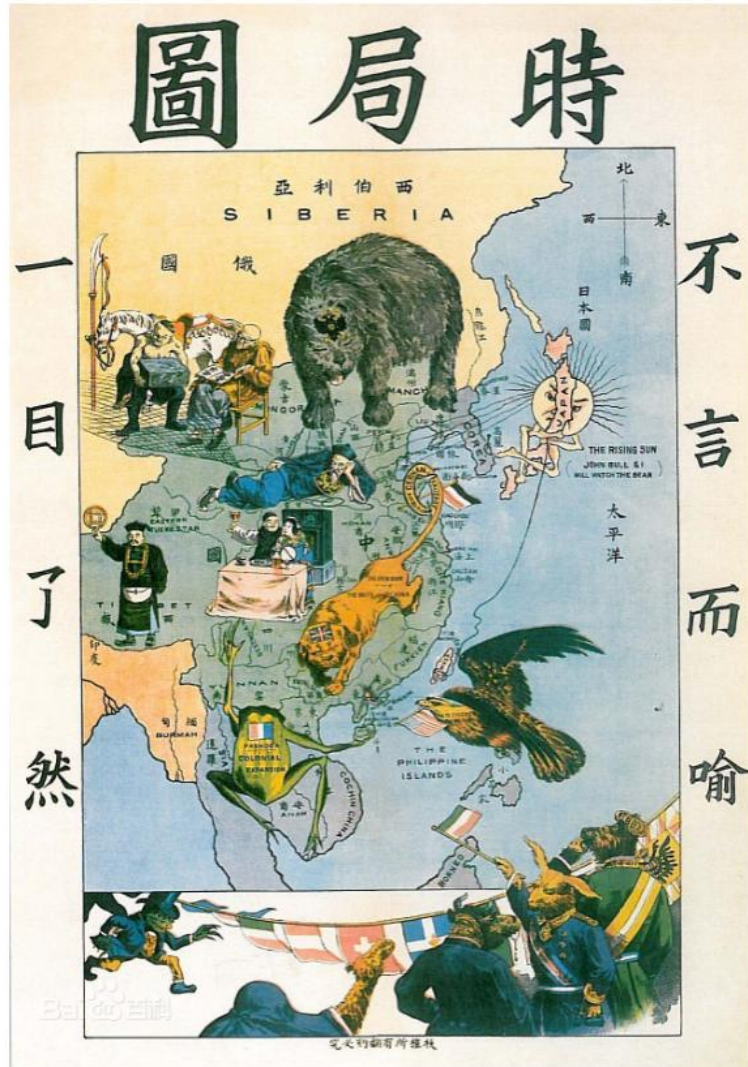
3

All of them have a huge impact on the world order; For the first time, capitalism established its rule over the world, and colonial expansion resulted in the East being subordinate to the West. The second time, the capitalist world system and colonial system were finally formed, and the world became an inseparable whole. For the third time, it has promoted the adjustment of the international economic structure, and the economies of countries around the world are interdependent and increasingly interconnected.

4

- All of these have brought about earth shattering changes in the world order, originating from the first industrial revolution in Britain, which organized manufacturing on a large scale with Britain as the core, and the gap between Western European countries and China continued to narrow.
- In the Second Industrial Revolution, as the main source of inspiration, the United States took this opportunity to surpass Britain and become the new No.1 power. At this stage, a pattern was formed where a few countries such as Europe and America were generally ahead of other countries in the world.
- In the Third Industrial Revolution, the international competitiveness of the United States was further enhanced, and it continued to maintain its leading position among countries around the world.

The impact of the first three industrial revolutions on China



- Before the 1970s, the former three industrial revolutions did not have a significant impact on China's economic modernization, due to the following reasons:
 - When the first industrial revolution was launched, China was on the eve of the Opium War, and the Qing government closed its doors to the outside world; After the Opium War, although the Self Strengthening Movement learned Western technology and founded modern enterprises, they did not change the backward social system.
 - During the Second Industrial Revolution, imperialism sparked a frenzy of dividing China, and the political situation in China was unstable. The national bourgeoisie demanded the development of capitalism, but was oppressed by their own feudal forces and foreign capitalism.
 - During the third technological revolution, China adopted a highly centralized economic and political system for a long time, and "leftist" errors continued to develop; The country has long been isolated, blockaded, and surrounded by the capitalist camp.
- From the historical laws of the former three industrial revolutions, whoever develops better in science and technology will become the center of the world and may also become the initiator of the new industrial revolutions .

The Fourth Industrial Revolution

- The Fourth Industrial Revolution is a social production mode transformation driven by technologies such as the Internet of Things, big data, robots, and artificial intelligence. The core is the deep integration of networking, informatization, and intelligence.



Characteristic 1

Deep networking is an important feature.

Characteristic 3

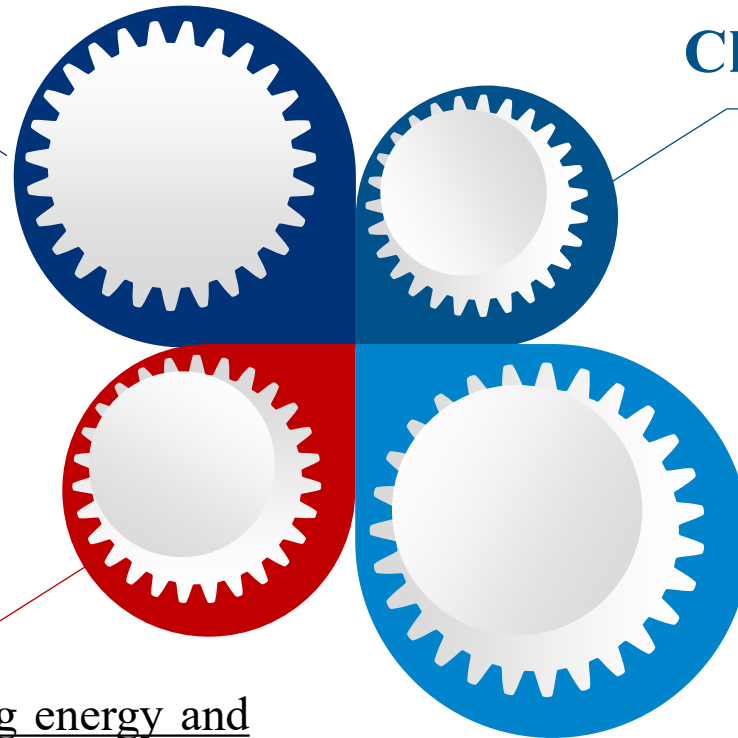
Humanity will move towards an era of coexistence with intelligent robots

Characteristic 2

A significant revolution in improving energy and resource utilization efficiency

Characteristic 4

We will promote significant changes in the production organization mode.



Technological Innovation

Artificial intelligence technology

Intelligent AI with Deep Learning;

Chip technology

Chips are the lifeline of the Fourth Industrial Revolution;

Overall computing power improves rapidly in the 4th revolution;

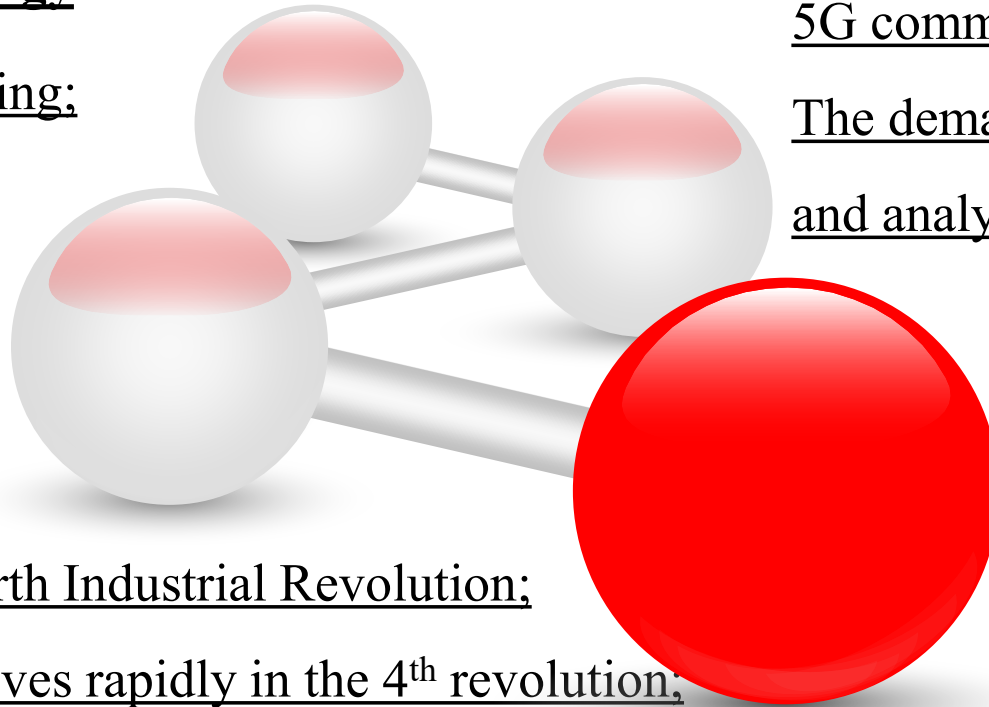
Data storage and transmission

The ultra-high data transmission efficiency of 5G communication technology;

The demand for secure storage, fast querying, and analysis of massive data;

Industrial robot technology

Industrial robots are widely used.



Let's take a look at the evolution of one of the world's most famous large-scale models: Gemini

- Google Workspace enables the future of AI-powered work for every business
- Gemini is an artificial intelligence model released by Google DeepMind (an artificial intelligence lab established under Google's parent company Alphabet) on December 6, 2023. It can simultaneously recognize five types of information: text, images, audio, video, and code. It can also understand and generate high-quality code in mainstream programming languages such as Python, Java, and C++, and has comprehensive security assessments.
- Gemini 1.0 – 2023.12.06; Gemini 2.0 – 2024.12.11; Gemini 2.5 – 2025.05.21





Sharing:

- Would you please share 1 or 2 large models developed by Thailand? Such as Thai Large Language Model “Typhoon ” , etc.
- What large models have you utilized in your daily work? What tasks have these models assisted you with, and how do you perceive them?

Opportunities in the Fourth Industrial Revolution

- 1. The Fourth Industrial Revolution gave birth to data analysis, cloud computing, artificial intelligence and other emerging industries. Software, robots, the Internet and other industries have also entered a rapid development stage.
- The Fourth Industrial Revolution improved the productivity of China's manufacturing industry, reduced energy consumption and pollution emissions, promoted coordinated development between industries and the environment, and improved and optimized the economic structure.



Thoughts and Discussions:

- What negative impacts might AI and the Fourth Industrial Revolution bring to a country?
- In recent years, Thailand has been advancing 'Thailand 4.0'. What development experiences do you believe Thailand has that could serve as a reference for China?
- In Thailand's participation in the Fourth Industrial Revolution, in which area is there the greatest potential for deepening China-Thailand cooperation?
- In the field of technological development, does Thailand mainly rely on imports or its own original innovation? What are the advantages and disadvantages of each model?

(II)

China's New Industrialization Development

China's Manufacturing in 2025, China's Intelligent Manufacturing in 2035

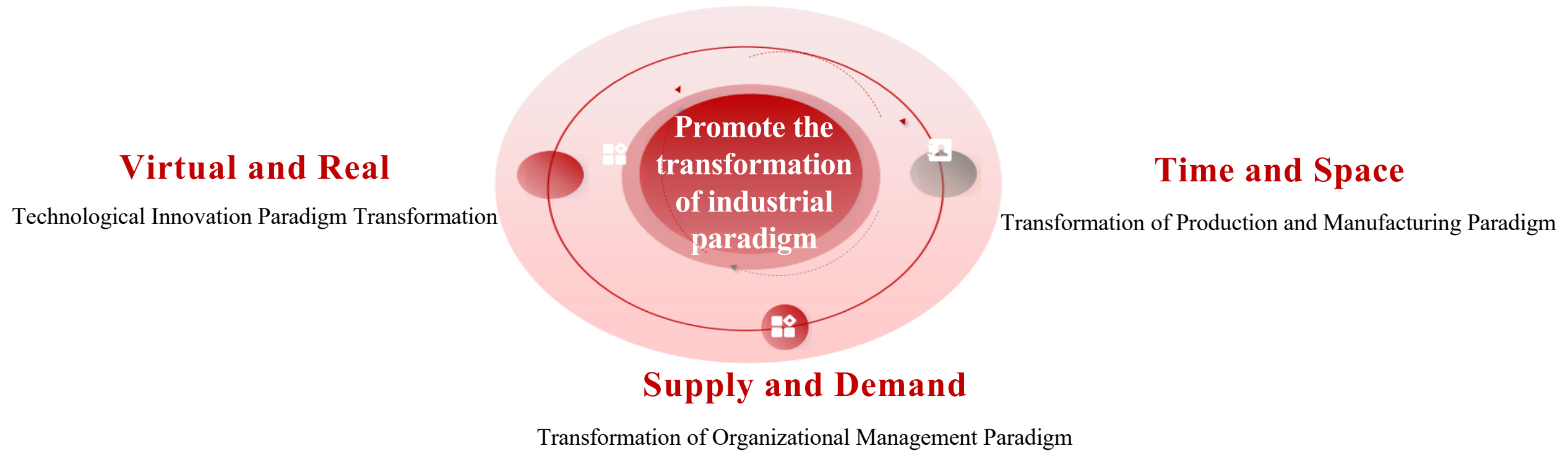
1、 The New Industrialization has New Connotations of the times

- Comprehensively implement the new development concept, coordinate development and security, deeply grasp the basic laws of the new era and new journey to promote new industrialization, actively adapt to and lead a new round of scientific and technological revolution and industrial reform.
- We need to put the requirements of high-quality development through the whole process of new industrialization, organically combine the building of a manufacturing power with the development of digital economy and industrial informatization, and build a solid foundation for China's path to modernization.



2、 Artificial intelligence will drive a paradigm shift in industry

- The world is undergoing unprecedented changes that are accelerating, and a new round of technological revolution and industrial transformation is deepening. AI, as the core technology of the fourth industrial revolution, has its unique characteristics. The technological advantages and potential for change, in line with the inherent requirements of new industrialization, will comprehensively and deeply empower industrial development, accelerate industrial intelligence, integration, and greening, and promote deep adjustment of the global industrial chain and supply chain.
- In AI era, the boundaries between virtual and real, time and space, will no longer be so clear.



2、 Artificial intelligence will drive a paradigm shift in industry

- Artificial intelligence breaks the boundary between virtual and reality, driving fundamental changes in the paradigm of technological innovation.

Physical space experiment verification

Digital space simulation verification

- The product research and development, process optimization, and process reengineering in traditional manufacturing often involve "master craftsmen".
- Relying on the experience of "master craftsmen" and conducting extensive experimental verification in physical space often results in long cycles, high costs, and high risks.
- Connecting physical space and digital space, promoting design, simulation, verification, etc.
- All processes can be completed in the digital space, which has the characteristics and advantages of real-time efficiency, zero marginal cost, and flexible architecture, greatly reducing the time and economic costs of physical space testing and verification;
- Promoting the transformation of technological innovation models from experience based trial and error to data-driven has significantly improved the efficiency and accuracy of technological innovation.

Typical case: Google releases new material development model GNoME

In the past decade, scientists from around the world have discovered 28,000 new materials through computer simulations. Adding to the approximately 20,000 stable materials discovered by humans using traditional experimental methods, the total number of stable crystals discovered by humans before the use of artificial intelligence assisted material discovery reached 48000.

With the help of the artificial intelligence material discovery tool GNoME model, researchers have discovered 2.2 million new crystals in a short period of time, which is equivalent to nearly 800 years of knowledge accumulation by human scientists. Among them, 380,000 new crystals have stable structures and become the most likely potential new materials to be synthesized and put into use through experiments. Thanks to the powerful capabilities of GNoME, the number of known stable materials has increased nearly tenfold, reaching 421,000 categories.



3、 The large-scale application and promotion of artificial intelligence technology has ushered in an historical opportunity

Whether a technology can trigger fundamental changes in the economy and society depends on whether it can achieve a "double reduction", that is, lowering the threshold and reducing costs.

In 1885, Karl Benz manufactured the world's first tricycle equipped with a gasoline engine and applied for a patent in Germany on January 29, 1886, giving birth to the first automobile in human history. At the beginning of the invention, due to the complexity of technology and high production costs, only a few wealthy people and enterprises could afford it.

With the passage of time and continuous technological advancements, car manufacturers have begun to focus on reducing costs. On October 1, 1908, the Ford Model T was officially launched at a price of only \$850. At that time, the general selling price of cars in the United States was around \$4700, which was equivalent to the income of a small executive for about 5-6 years at that time. The T-type car could basically be owned with just one year's income, and the low selling price ultimately led to Henry Ford receiving a large number of orders.

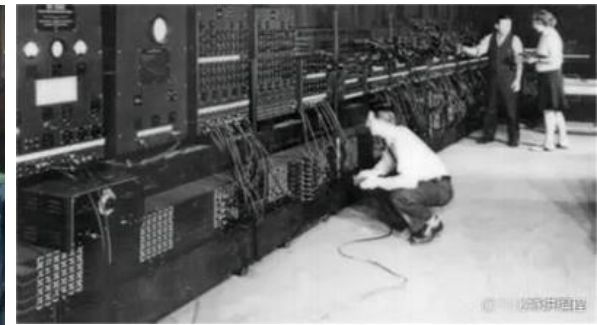
In 1913, Henry Ford greatly reduced the manufacturing cost and production time of automobiles by introducing the assembly line production method. At that time, other car manufacturing companies needed over 700 hours to produce a car, while the Ford Model T only took 12.5 hours, and the price of the Model T dropped to \$360. The low price makes it affordable for the middle class and ordinary consumers, making cars a widely adopted means of transportation.



car



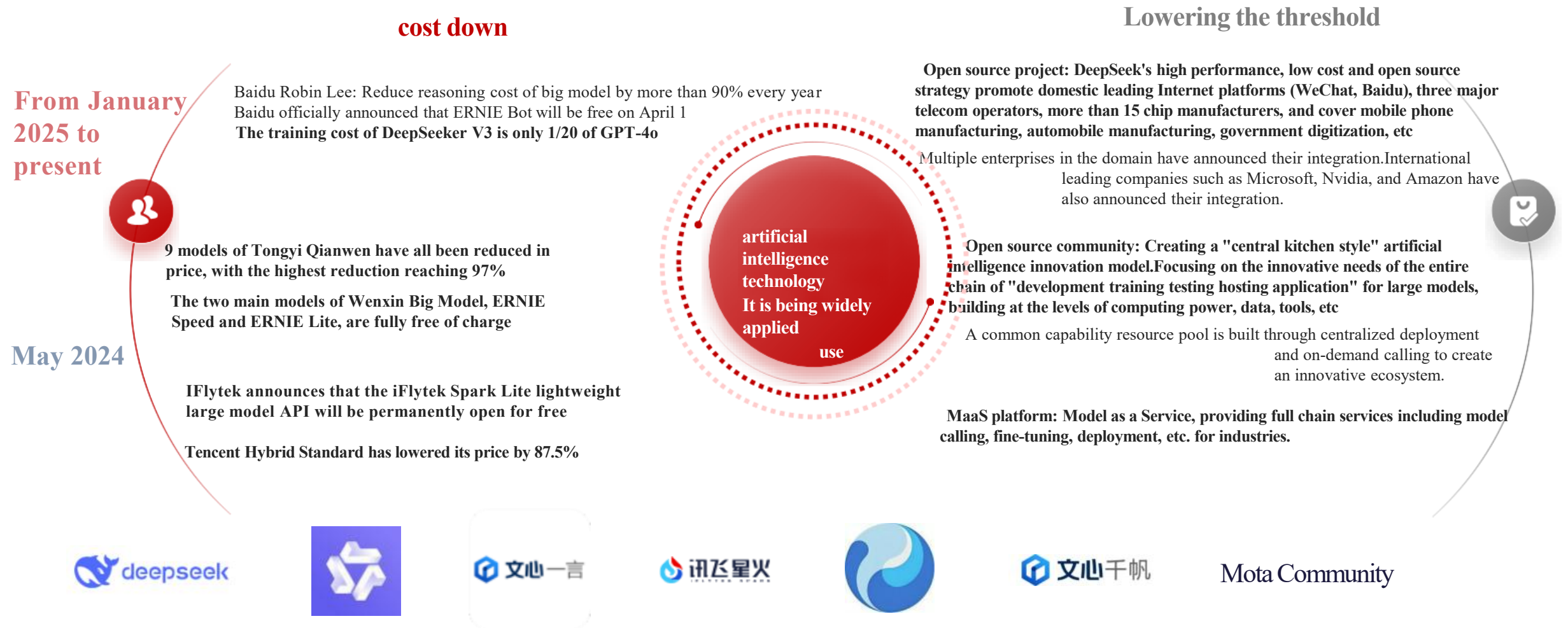
steam engine



computer

3、 The large-scale application and promotion of artificial intelligence technology has ushered in an important opportunity

- Artificial intelligence, as a universal technology in today's era, has continuously lowered costs and barriers to entry, opening up new spaces for empowering various industries.



4、 Artificial intelligence empowers new industrialization and accelerates its deepening towards reality

The full chain intelligence drives the upgrading of the manufacturing industry, giving birth to a new model of research and development, production, and service

• Personalized customization

Wanshili Silk uses AIGC customized scarves, which can be designed and produced by users in as little as 2 hours.

Intelligent production

- Based on the Baidu AI Cloud Qianfan model, Zhongtian Iron&Steel has built an "enterprise scheduling center" to achieve intelligent scheduling and production scheduling.

Predictive maintenance

Hebei Iron and Steel utilizes large models to achieve predictive maintenance, reducing equipment operation and maintenance costs by 5% and improving operational efficiency by 10%.

The BMW Brilliance team has applied an AI visual inspection system to the quality inspection of car cylinder heads, effectively improving inspection accuracy and increasing production efficiency by nearly 30%.



Multi technology cross domain deep integration and innovation, stimulating new driving forces for high-quality industrial development

Humanoid robots accelerate their market-oriented landing

Zhangjiajie, Hunan Province introduces humanoid robots to interact with tourists.

The Unitree H1 and G1 humanoid robots from Yushu Technology are available for sale online.

It is expected that the global market size of humanoid robots will grow from \$2.03 billion in 2024 to \$13.25 billion in 2029, with a compound annual growth rate of 45.5%.

Autonomous driving drives the emergence of new forms of transportation

- Apollo Go supports L4 driverless driving and has opened services in some areas of Beijing, Shanghai, Guangzhou, Shenzhen, Wuhan, Chongqing and other cities.

Smart low altitude transportation accelerates the development of low altitude economy

Shenzhen is building low altitude air routes to support new formats such as drone delivery of food, drone delivery of express delivery, and low altitude flights.



Intelligent iteration and upgrading of software and hardware products, cultivating and forming a new growth pole for economic development

AI terminal products open up a new high growth consumption track

In 2024, China's smart home system will grow by 22.9%.

During the "Double 11" period, the sales volume of JD AI hardware increased by over 100% year-on-year.

High end equipment intelligence reshapes new competitive advantages in the industry

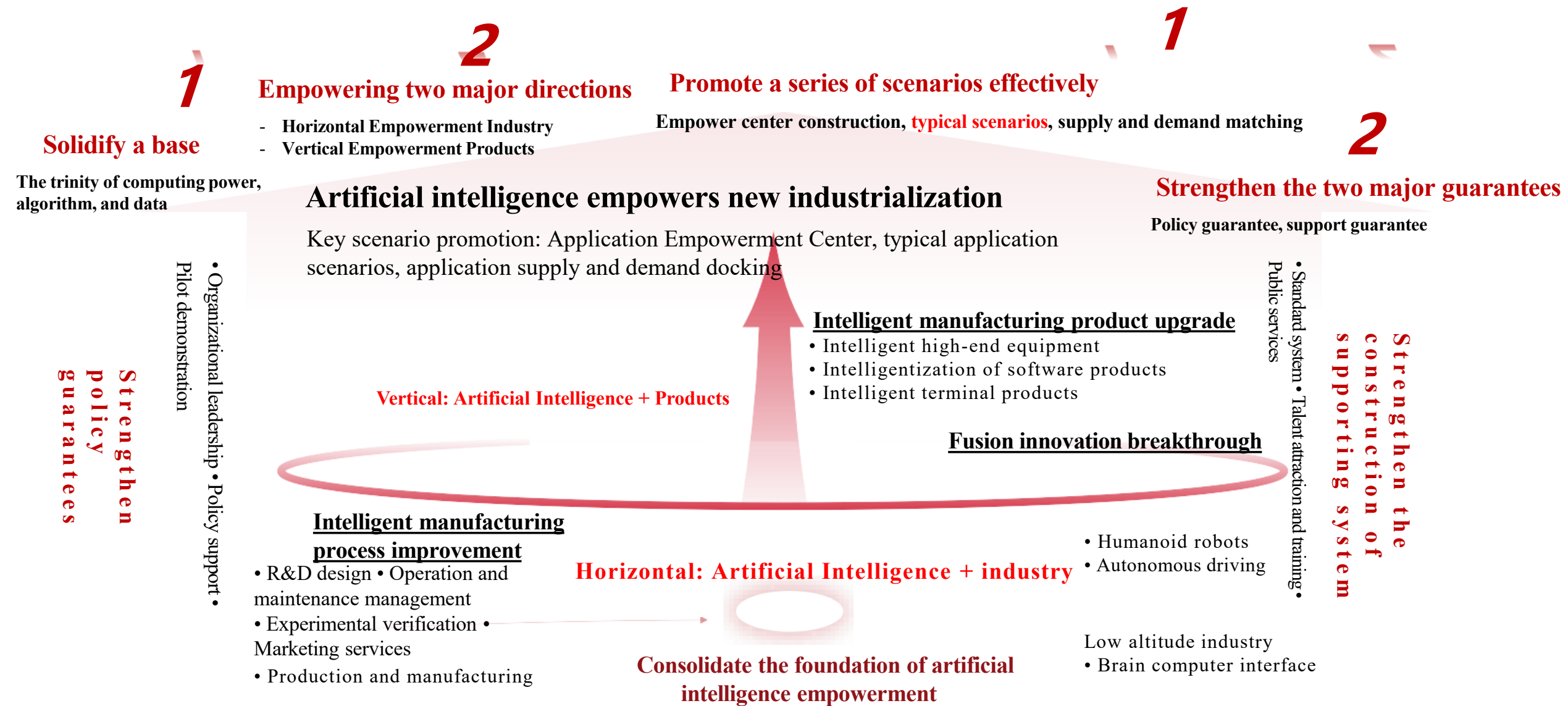
China Construction Fifth Engineering Bureau Engineering Innovation Research Institute has developed an intelligent welding robot for bridge steel mesh, achieving fully automated and efficient welding processes.

AI Agents are emerging

AI agents can complete complex processes from planning to execution, demonstrating universal capabilities across scenarios and domains.



5、 Artificial intelligence empowers the development path of new industrialization

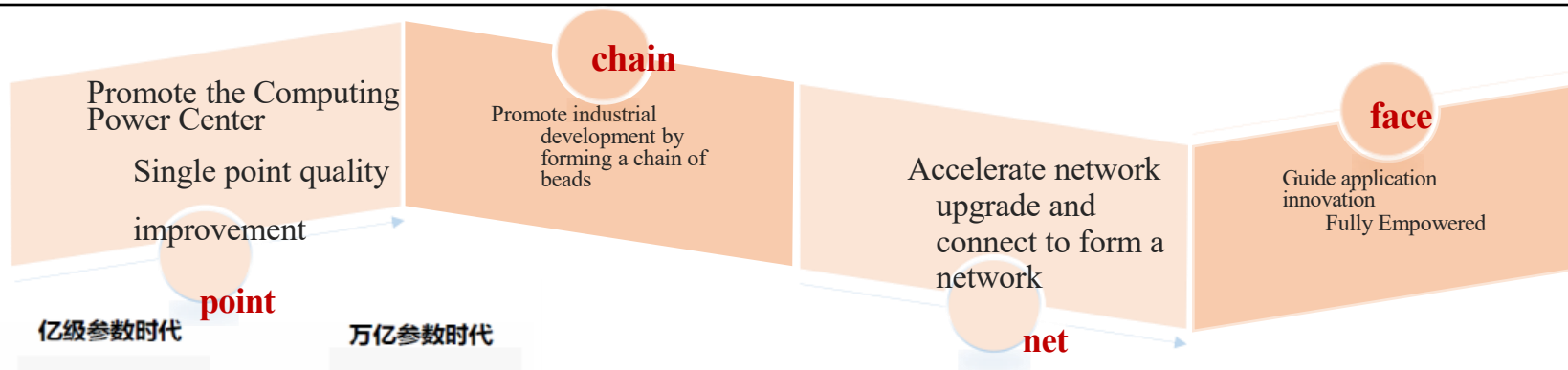


5、Artificial intelligence empowers the development path of new industrialization

Consolidate a Base: Consolidate the AI Empowered Base

Chip computing power

In recent years, the demand for computing power in China has grown exponentially, and many regions have actively laid out the computing power industry. By the end of 2024, the total computing power scale in China has reached 280 E-FLOPS (billions of floating-point operations per second, calculated with FP32 single precision), of which the intelligent computing power scale reached 90 E-FLOPS (FP32) , The proportion is 32%.



	万级参数时代		亿级参数时代		万亿参数时代
计算需求	百TF级平台 1张GPU卡	X10倍	PF级平台 单服务器, 8卡	X1000倍	EF级平台 AI集群, ~万卡
网络需求	无互联	N/A	节点内卡间互联	X100倍	超节点+网络互联
存储需求	GB级存取 -服务器硬盘	X100倍	TB级存取 -服务器硬盘	X1000倍	PB级存取 -高并发多级存储

Support AI chip testing and development, and build a supporting software platform ecosystem. Promote the high-quality development of computing infrastructure and build a cloud edge integrated computing capability. Adhering to the principle of government guidance and market leadership, we will orderly promote the systematic development of computing power networks in terms of "points, chains, networks, and surfaces". We will study and launch a series of special actions such as "unveiling" and "empowering" computing power, continuously optimize the layout of computing power resources, strengthen core technology research and development, improve the quality of network services, and enrich the application scenarios of computing power.

5. Path of new industrialization development empowered by artificial intelligence

Consolidate a foundation: Consolidate the foundation enabled by artificial intelligence

Algorithm model

Currently, the industry consensus has shifted from small models to large models, and further to unified multimodal large models. With the continuous breakthroughs in multimodal large models, artificial intelligence (AI) is expected to achieve various functions such as spoken dialogue, visual question-answering, and intelligent creation in a wider range of application scenarios, empowering traditional industries and injecting new imagination. This technological trend will inevitably further accelerate the integration and innovation of AI and manufacturing, opening up vast prospects for the development of new industrialization.



- ✓ "Science and Technology Innovation 2030 - Major Project of 'New Generation Artificial Intelligence'"
- ✓ "Guide for Major Research Projects of the Next Generation of Artificial Intelligence Methods with Explainability and Generalizability in 2023"
- ✓ AI industry innovation tasks unveiled and leadership announced (future industry unveiled and leadership announced)

- ✓ Strengthen research on underlying algorithms such as language, vision, and multimodal algorithms, and develop high-performance algorithms that are suitable for the characteristics of the industrial field.
- ✓ Promote the enhancement of large models' adaptability to cross-scenario tasks and complex environments in the industrial field, and facilitate the collaborative application of large and small models.

5. Path of new industrialization development empowered by artificial intelligence—DATA

Consolidate a foundation: Consolidate the foundation enabled by artificial intelligence

Data supply

Vast amounts of high-quality data serve as the foundation of the large models. Looking at the cutting-edge trends in the industry, the scale of datasets used for training large models is experiencing explosive growth, posing higher demands on the volume, diversity, and update speed of training data.

Support industrial enterprises in strengthening their data management capacity building,
Enhance data collection, cleaning, annotation, processing, and Sharing and openness level.

Bringing together R&D design, production and manufacturing, and management
Collect multimodal data from various aspects of market services to build an industry corpus and a prompt word corpus.

Research and formulate standards and norms for the sharing, opening, trading, and circulation of industrial data, clarifying issues such as data property rights ownership, pricing mechanisms, trading rules, and revenue distribution.

GPT-1 dataset
4.6GB

GPT-3 dataset has reached
753GB

The data volume of
GPT-4 is even tens
of times larger than
that of GPT-3

Training data for GPT-5
It is possible to reach 200TB

(3)

The Data element in economic growth and Its impact on new productive forces

As a new type of production factor, data elements are integrated into various links such as production and distribution in economic activities?

Thoughts and Discussions:

- What are the important roles of data elements in economic development?
- What are the significant differences between data elements and other production factors?
- How to achieve limited, secure, and reliable sharing of data elements?

Data elements are the most important production factors supporting the development of new quality productivity

- Accelerate the popularization and application of new generation information technology in all directions and chains, develop industrial Internet, and build a digital industrial cluster with international competitiveness. Promote innovative development of platform economy and improve the normalized regulatory system for platform economy. Build and operate national data infrastructure to promote data sharing. Accelerate the establishment of a system for determining the ownership of data property rights, market transactions, rights distribution, and interest protection, enhance the capacity for data security governance and supervision, and establish an efficient, convenient, and secure mechanism for cross-border data flow.
- In 2022, the Central Committee of the Communist Party of China and the State Council issued the "Opinions on Building a Data Infrastructure System to Better Play the Role of Data Elements" (hereinafter referred to as the "20 Data Articles" of the country), which proposed that data, as a new type of production factor, is the foundation of digitization, networking, and intelligence. It has quickly integrated into various links such as production, distribution, circulation, consumption, and social service management, profoundly changing the mode of production, lifestyle, and social governance. The construction of data infrastructure system is related to the overall development and security of the country.

Data element policies are gradually being promoted

November 2019	The Fourth Plenary Session of the 19th CPC Central Committee pointed out: "Establish a mechanism for evaluating the contribution of production factors such as labor, capital, land, knowledge, technology, management, and data by the market and determining remuneration based on their contribution," and for the first time listed "data" as a new production factor.
April 2020	The Central Committee of the Communist Party of China and the State Council have issued the "Opinions on Building a More Complete System and Mechanism for Market oriented Allocation of Factors", which includes data as a new type of production factor in the document, and ranks it as the fifth largest production factor along with traditional factors such as land, labor, capital, and technology. For the first time, it proposes to "accelerate the cultivation of the data factor market".
October 2022	General Secretary Xi Jinping pointed out in the report of the 20th National Congress of the Communist Party of China that efforts should be made to accelerate the construction of a "digital China".
December 2022	The Central Committee of the Communist Party of China and the State Council have issued the "Opinions on Building a Data Infrastructure System to Better Play the Role of Data Elements" (also known as the "20 Articles on Data"). As China's first fundamental document specifically targeting data elements, the "20 Articles on Data" provide clear directions for the construction of China's data element market. The document specifically proposes to establish four systems: "Establish a data property rights system to protect rights and interests and ensure compliant use", "Establish a compliant, efficient, and integrated data element circulation and trading system", "Establish an efficient and fair data element income distribution system", and "Establish a secure, controllable, and flexible data element governance system".
March 2023	The National Data Administration has been established to coordinate and promote the construction of data infrastructure systems, coordinate the integration, sharing, and development of data resources, and promote the planning and construction of digital China, digital economy, and digital society. It is managed by the National Development and Reform Commission. The establishment of this institution will solve the problem of decentralized management system in the data field.
August 2023	The Ministry of Finance has issued the Interim Provisions on Accounting Treatment of Enterprise Data Resources, which stipulate the scope of recognition of data resources, applicable accounting treatment standards, and disclosure requirements. It will come into effect on January 1, 2024.
December 2023	The National Data Administration and 17 other departments jointly issued the "Three Year Action Plan for 'Data Elements X' (2024-2026)"
July 2024	

Data elementization

- Data elements are a new type of production factor, which refers to the basic resources that effectively develop and utilize data through collection, processing, storage, analysis, and other methods in the modern digital economy, thereby bringing productivity improvements to the economy and society.

data ~~=~~ data elements?

Money is not equal to capital

Person are not equal to manpower

Data is not equal to Data Elements

Data element conditions

- Data readability

- Data circulation

Data Elementization

- Establishing data as an important factor of production and involving it in social production and business activities through various ways. The process has gone through two leaps.

Data Resource Utilization

- It is a prerequisite for the release of the value of data elements
- Including the acquisition of raw data and the organization of data processing in the later stage



The First Leap

- From resource utilization to assetization
- Productization and formation of market circulation

Data Assetization

- Establishing the asset attributes of data in legal terms
- This means that data can generate sustained returns in the future



The Second Leap

- From assetization to capitalization
- Motivate capital to participate in industrial development and stimulate innovation momentum

Capitalization of Data

- Through forms such as data equity and data securitization
- Generating greater value for data elements



1、 Data elements play an important role in economic development

Productivity attributes of data elements

- As a new type of productivity, data elements have become the core driving force for promoting the development of new quality productivity and driving economic growth. Its productivity attributes are reflected in the following aspects:

1. Enhance Total Factor Productivity (TFP)

The application of data in enterprise production, logistics, and services can enhance information transparency and resource utilization efficiency. By optimizing the supply chain and production processes through big data analysis, enterprises can generate more value with less input. For example, the industrial Internet platform uses data to monitor equipment status, reduce downtime, and improve productivity.

2. Support intelligent decision-making

By analyzing market trends, user preferences, and other data, companies can make more accurate decisions. Intelligent marketing and dynamic pricing strategies rely on data analysis to improve market sensitivity and response speed.

3. Support Data driven innovation

Data has become the fundamental resource driving innovation. Whether it is new product development or business model innovation, the deep integration of big data and artificial intelligence technology is driving the digital upgrading of economic activities.

The Empowerment of Digital Economy by Data Elements

- Data elements have become an important pillar of the digital economy and are driving the integration of the digital economy and the real economy through the following ways:

1. The coordinated development of digital economy and real economy

For example, data asset securitization in financial markets (such as consumer data, logistics data) is helping companies capitalize their data resources and achieve financing and investment optimization. Enterprises achieve cross industry cooperation through data, improving the synergy effect of the industrial chain.

2. The Implementation Path of Data Capitalization

The Shanghai Data Exchange and Guangzhou Data Exchange, as typical cases, have launched data asset securitization products, endowing data with financial attributes. The securitized data is circulated as financial products in the capital market, creating financing opportunities for enterprises.

3. Empowering the transformation of the real economy

Through the collection and analysis of data through the Internet of Things and smart devices, traditional industries such as manufacturing, agriculture, and retail have gained the ability for digital upgrading. For example, smart agriculture optimizes crop planting through real-time data monitoring, improving agricultural output rates.

Promote the development of new industries and formats

- The application of data element markets in emerging industries is reshaping the economic landscape

1. The value of cultural and tourism data zones, government data, and other fields

The widespread application of data in the cultural tourism industry and government data makes personalized services and intelligent recommendations possible. For example, by analyzing tourist behavior data, scenic spots can optimize management and enhance tourist experience. For example, Tongzhou District in Beijing has established a cultural and tourism data zone to achieve intelligent and refined management of the tourism industry.

2. The Development of Metaverse and Virtual Economy

The construction of the metaverse relies on the support of massive data, which drives the generation, trading, and management of virtual assets through data-driven approaches. NFT (Non fungible Token) and virtual goods in the virtual economy are forming a new digital economy ecosystem.

3. Smart cities empowered by data

The data-driven construction of smart cities covers multiple fields such as transportation, energy, and public services. Real time traffic data analysis improves the efficiency of urban management, while smart grid data ensures efficient energy allocation.

Promote the development of small and medium-sized enterprises

- The data element market not only serves large enterprises, but also provides new opportunities for the development of small and medium-sized enterprises:
 1. Expanding financing channels: Capitalization of data enables small and medium-sized enterprises to obtain financing through data assets. For example, e-commerce companies can obtain loan support from financial institutions by proving their credit level through transaction data.
 2. Improving operational efficiency and market competitiveness: Small and medium-sized enterprises obtain market information through data platforms, optimize supply chain management and customer relationship management systems. Real time data enables enterprises to adjust their business strategies in a timely manner and respond to market changes.
 3. Assisting enterprises in overcoming their growth phase: Data elements provide precise marketing and business analysis support for small and medium-sized enterprises, reducing operational risks during the growth stage. By collaborating with data trading platforms, enterprises can efficiently access data resources and accelerate growth.



2、 Integration of digital economy and industry Forming new industries, new formats, and new models

Current Development Status of Digital Economy Industry

- (1)Rapid expansion of industrial scale

The "2023 China Data Trading Market Research and Analysis Report" shows that the size of China's data trading market reached 87.68 billion yuan in 2022 and is expected to increase to 515.59 billion yuan in 2030. This reflects the enormous potential of the market and also indicates the core position of the data trading market in driving the digital economy.

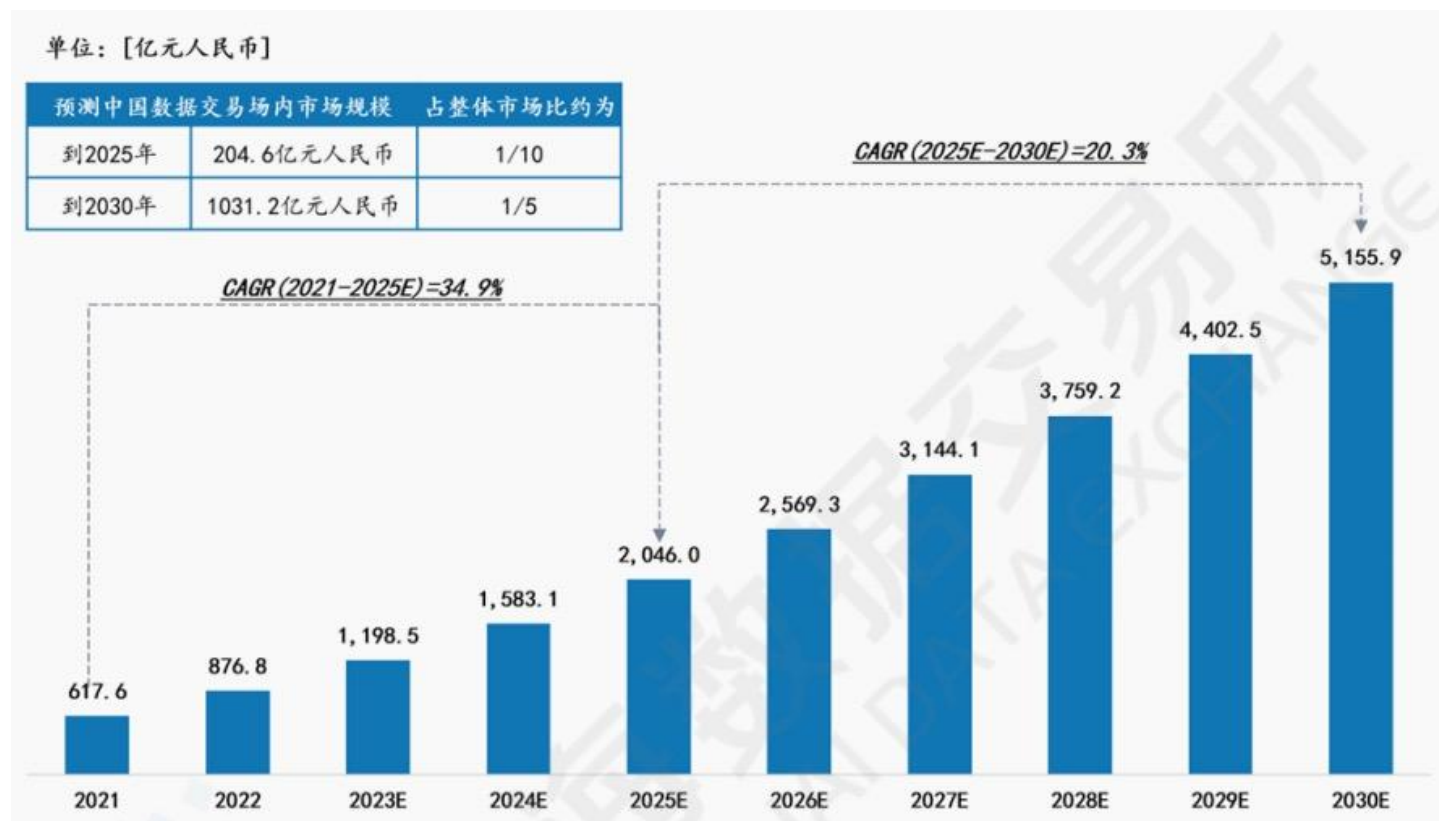


Chart: Market Size of China's Data Trading Industry, Forecast for 2021-2030
(Calculated by Transaction Volume)

Source: Head Leopard Research Institute

Current Development Status of Digital Economy Industry

(2) New infrastructure plays a supporting role

The country vigorously promotes the construction of infrastructure such as 5G networks, data centers, and artificial intelligence computing platforms, providing strong support for data circulation. Various regions are actively building 5G networks and data centers, and computing power platforms are emerging. The "Suanjuyuan" platform released in Guangzhou integrates computing power, trading, and scenarios, enhancing data computing and analysis capabilities and providing strong support for digital transformation in fields such as finance and agriculture.

(3) Policies and regulations guide development

National policies such as the "Twenty Data Articles" and the "14th Five Year Plan for the Development of Digital Economy" have laid the foundation for the high-quality development of the digital economy. At the local level, Shanghai's data asset tokenization roadmap and Guangzhou's cross-border data circulation mechanism have promoted the market-oriented application of data and regional coordinated development.

(4) Wide application of data across multiple industries

In the financial field, intelligent risk control and investment advisory services have improved market efficiency; In the manufacturing industry, the industrial Internet has promoted the digitalization of production management; In the medical field, Shenzhen's health big data has helped with personalized medicine and epidemic prevention and control.

The Problems Faced by the Development of Digital Economy Industry

- Data ownership and revenue distribution issues:
Despite the gradual development of the data element market, the current systems for data ownership, profit distribution, and cross regional data circulation are not fully mature. The lack of uniformity in regulations and standards across regions has led to insufficient enthusiasm from enterprises and governments in data transactions. Some enterprises refuse to participate in transactions due to concerns about data leakage and property disputes, which has affected the further expansion of the data market.
- Data security and privacy protection issues:
There are risks of data leakage and privacy in the process of data transactions, and the market needs stronger regulatory and data governance systems to ensure the secure use of data.
- Low data quality and serious homogenization issues:
At present, there are few types of data products in the market and severe homogenization, lacking high-quality data products and deep processing capabilities, which restricts the diversified development of the data market.
- The problem of uneven digital infrastructure among regions:
Although the infrastructure in first tier cities is relatively complete, there are still problems of insufficient network coverage and technological lag in remote areas, which hinder the popularization of the digital economy. We need to accelerate the layout of 5G networks and data centers through new infrastructure projects to improve the level of digital infrastructure nationwide.
- Technical Challenge Issues:
The expansion of the data market relies on technologies such as big data, cloud computing, and artificial intelligence, but technology investment and infrastructure construction still face challenges, especially in some regions where digital infrastructure construction is relatively lagging behind.
- Coordination issues among market participants:
The data supply and demand between the government, enterprises, and individuals have not been fully connected, the degree of marketization is low, and a complete ecosystem has not yet been formed. In some regions, the lack of smooth sharing between public and private data has affected the efficient utilization of data elements.



3、 Data element market

Significant significance, numerous difficulties

Data Element Market

- The data element market refers to a market system formed around data elements, in which data, as a production factor, realizes its economic value and social benefits through processes such as ownership confirmation, pricing, circulation, sharing, and trading.
- The data element market not only includes the trading of data resources, but also involves services, tools, technologies, and applications related to data. Through data trading, sharing, and application, the data element market promotes the formation of emerging industries and the digital transformation of traditional industries. The data element market provides a platform and mechanism for data ownership, trading, and profit distribution, making data a tradable asset. Through data marketization, the potential value of data can be released, providing important support for the development of the digital economy.

The Significance of Marketization of Data Elements

- 1、 Empowering the development of the digital economy. The efficient circulation of data elements requires trading in the capital market, and securities are the core part of the capital market. Data elements are deeply integrated with the capital market through securitization products, transforming them into data capital and creating greater value, driving the digital economy towards a comprehensive expansion period.
- 2、 Stimulate new driving forces for economic development. The combination of digital elements and securitization is conducive to improving the efficiency of data element market circulation, and exerting the multiplier effect of digital elements, driving the flow of funds and talents, and combining them with the remaining production factors. Digital assets are conducive to releasing some resources that were originally unable to be traded, constantly radiating to more fields, giving birth to new industries and new business models, changing the existing economic development model, and stimulating economic vitality and creating new economic growth drivers through the development of data markets.
- 3、 Accelerate the market-oriented circulation of factors. Through data securitization, it is beneficial to realize the value of data, accelerate the market-oriented circulation of factors, release the value dividends brought by digital factors, and innovate the development and utilization mechanism of data factors.
- 4、 Promote the development of small and medium-sized enterprises. The securitization of data elements has brought new financing channels and opportunities for small and medium-sized enterprises, helping them smoothly pass the growth period and enhance their core competitiveness.
- 5、 Further enrich the securities product system. Combining digital elements with securities can help enrich the diversity of securities market products. Through the allocation of data resources and value appreciation, it is conducive to promoting the research and development of securities products, and improving the operational efficiency of the securities market and even the capital market.



北京国际大数据交易所

Beijing International Data Exchange

国内领先的数据交易基础设施 国际重要的数据跨境流动枢纽

4、 The marketization of data elements needs to address five major challenges

The marketization of data elements urgently needs to address five key difficulties

- Data is an important production factor in the new era, an important strategic resource for the country, and a core force for the development of the digital economy. To fully tap into the deep value of data, it is mainly necessary to accelerate the market-oriented allocation of factors and promote the capitalization of data factors. The main means is to use data resources that are valued and securitized as the basis to achieve the preservation and appreciation of data factors.
- In the process of realizing data securitization, issues such as determining data ownership, data trading mechanisms, data security, data silos and monopolies constrain the circulation of data elements. How to solve the problem of securitization of data elements and strengthen the construction of data element markets is particularly urgent.
- Through extensive literature review, corresponding solutions are proposed for the five major difficulties in the data element trading market, in order to promote the circulation of data elements, explore the deep value of data, and empower the digital economy with corresponding countermeasures and suggestions.

Difficulty 1: How to achieve data ownership confirmation and separation of three rights

- The ownership of data is mainly divided into ownership, management, and usage rights. The main difference between data elements and other production factors is that the ownership, usage, and management rights of data elements need to be reasonably separated. A major issue facing the construction of the digital factor trading market is how to achieve the separation of the three rights of data. Generally speaking, persons in a country are the providers and owners of data, while some Internet enterprises are the operators and processors of data, and customers such as individuals, enterprises or scientific research institutions are the users of data.
- By separating the ownership, usage, and management rights of data, the flow of data elements among different entities can be achieved. The separation of data rights is not only about the ownership of data, but also includes issues such as the distribution of corresponding subject interests. This can effectively reduce transaction costs in the factor market, and also facilitate enterprises to explore the value of data elements while protecting users' reasonable privacy rights. Clear property rights definition is very important for the operation of the data element trading market. Therefore, the confirmation of data ownership is a prerequisite for the value and marketization of data elements. However, there is currently no specialized institution in China that verifies the ownership of personal data.



Difficulty 2: How to achieve the protection and sharing of trusted data

- Data is quite different from physical objects, as it has special properties of its own. The fundamental value of data lies in its authenticity, and data sharing is the way it forms value. However, as data can be copied, data sharing cannot be freely disclosed like ordinary items, and can only be limited. This creates a special contradiction between the authenticity, protection, and sharing of data.
- Therefore, in order to achieve value and marketization of data elements, it is necessary to solve the problem of limited sharing of trustworthy data.

Challenge 3: How to break down data silos and data monopolies

- Data silos refers to a state where data is divided and stored in different entities or departments, becoming individual datasets that cannot be interconnected, shared, or integrated. In this state, data is like isolated islands on the sea surface that cannot be communicated with each other. One concept associated with data silos is data monopoly. In the data market, large enterprises with market dominance can use big data to implement "data monopoly" behavior.
- The monopolistic behavior of data will have a serious impact on the efficiency of the data market, making it more difficult and complex to realize the value of data. For example, the Google/Double Click case, the Dianping v. Baidu case, the data disputes between Cainiao Waibao and SF Express, Sina and Today's Headlines, WeChat and Huawei, and so on. Data monopoly does not refer to a single enterprise owning a large amount of raw data, or data holders having exclusive ownership of data assets based on property rights systems, but rather refers to various market power abuse behaviors based on big data implemented by data holders in data collection and development.

Challenge 4: How to securitize data and price it reasonably

- Data securitization is the process of obtaining financing by using the future cash flows generated by data assets as repayment support, conducting credit enhancement through structured design, issuing sellable and tradable power certificates.
- At present, the overall development of data element trading and circulation market construction in China is in the preliminary stage, and the pricing of data elements cannot be determined. It is difficult for data elements to become data assets and thus difficult to achieve securitization and enter the factor market for circulation and trading. How to seize the securitization development of digital elements is of great significance for the development of China's digital economy, enhancing economic vitality, financing for small and medium-sized enterprises, and market-oriented development of data elements.

Difficulty 5: How to establish a unified data trading market

- The market plays a decisive role in resource allocation. As a new element, data configuration also needs to fully leverage the role of the market. Therefore, the demand for building a high-level data trading market has emerged. In recent years, various regions in China have been actively exploring the construction of data centers and data markets, manifested in the emergence of local data trading platforms such as Guiyang Big Data Exchange, Beijing International Big Data Exchange, Tianjin North Big Data Trading Center, and Shanghai Data Exchange. At present, the existing data trading platforms in China have covered seven major geographical regions including North China, East China, South China, Central China, Southwest China, Northwest China, and Northeast China. These positive explorations have achieved certain results.
- However, The current data trading market still faces problems such as regional segmentation and inconsistent trading standards, which restrict the free flow of data elements nationwide. More importantly, the current data trading platforms do not have professional institutions for "data rights verification" of "personal data", which will seriously affect the value and marketization of personal data.



5、 Implement encryption and sharing mechanism for personal data ***

How to achieve trustworthiness, encryption, and sharing of personal data

(1) Implement a trustworthy mechanism for personal data

- To achieve the credibility of personal data, we believe it is necessary to deploy a blockchain system and explore the use of a small number of independent data repositories, peer nodes, and blockchain technology (such as super ledger systems) to ensure the reliability of data. Specifically, as follows:
- 1. API driven query/response control: The API defined in the data repository provides a "hard wired" query function. The searcher executes queries by sending messages to APIs in the repository, which in turn send the results to the searcher. The API itself defines the types of queries accepted and the granularity of the answers returned.
- 2. Only aggregate answers: The API will return 'safe answers' in the form of aggregated/statistical answers. This method conforms to the key principle of never allowing raw data to leave the repository.
- 3. Multiple repositories: Imagine multiple data repositories, where each repository can only store one type of data constrained by its API (such as GPS location). For the searcher, nodes in the network collaboration environment allow the searcher to access a large number of data repositories, which can be represented as nodes in the peer-to-peer network (i.e. nodes on the blockchain).
- 4. Metadata used for discovery: Shared data assumes that the existence of the data is known. Multiple nodes in a network collaboration environment can act as a "metadata directory" and return information related to the location of nodes with expected data.
- 5. Accessing request/response logs: Placing logs directly in the blockchain is an inefficient and poorly scalable approach. Both the searcher and the data repository track API calls and then hash the logs. Both parties must generate the same hash value for API calls and for data sent/received. These hash values can be written into the blockchain and can only be audited by all parties (to protect privacy).
- 6. Authorization and Identity: Authorization tokens will be used in conjunction with basic blockchain identities, with a focus on authorizing access to data repositories through published APIs. At this stage, we can start exploring the member service capabilities of systems such as Hyperledger.

(2) Decentralized encryption mechanism for personal data

■ Implement decentralized encryption mechanism for personal data

1. The original data is kept in a local location in the repository: the data remains private and no node can see the original data of the other node. Additionally, each data item is located in its' belonging 'data repository (i.e., not in the peer node set).
2. Clear static data (unencrypted): Static data is clear and not hidden using key sharing encryption. In this way, our focus shifts to the algorithms and performance of multi-party computation.
3. Simple multi-party computation configuration with known nodes: A small number of repositories (such as 3 nodes) can be used to create the parties involved in multi-party computation. Each node in the opponent's computing instance will use a secure channel to ensure integrity protection against attacks, and each node will know the identity of other nodes.
4. Pre defined simple queries: Only simple queries will be addressed, and such queries may be pre-defined (template) queries. Complex queries, such as internal/external connections to tables, will be left for future processing.
5. Metadata service: Data types and available simple operations are "announced" on a special server, and queries can locate the location of relevant repositories on that server.
6. Preliminary evidence of multi-party computation completion: Multi party computation nodes need to use matching verification mechanisms to record the computation completion status of multi-party computation on the underlying blockchain. Although the evidence can be determined, each multi-party computing node included in the evidence is able to list its own steps and message flows (with other multi-party computing nodes), and record them on the blockchain for future re demonstration/verification.

(3) Limited sharing mechanism for personal data

■ Research on the Mechanism of Limited Sharing of Personal Data

Sharing data in a privacy preserving manner requires a fresh perspective on data. Some key concepts and design principles are as follows:

1. Move the algorithm to the data end: that is, execute the algorithm (i.e. query) at the data location (called the data repository). This means that the raw data must never leave its repository, and access to the data is controlled by the repository/data owner.
2. Open algorithms: Algorithms (i.e. queries or scripts) must be publicly released, researched, and reviewed by experts to ensure "security" and not violate privacy requirements and other requirements arising from the use of these algorithms.
3. Permitted use: Identity related attributes or data are provided as part of a transaction, so anyone who wants to perform calculations on these attributes or data must obtain the explicit or implicit authorization or consent of the data owner in advance.
4. Always return a 'safe answer' (not the original data): When performing calculations (such as answering queries), the data repository must always return a 'safe answer' and never return the original data. This concept aims to address data privacy issues and potential risks of identifying personal identifiable information (PII) through the association between multiple responses.
5. Data should always be encrypted (i.e. during static, transmission, and computation). The data does not need to be decrypted before calculation or re encrypted after calculation. Advanced encryption techniques have emerged that allow for limited form calculations to be performed on encrypted data.
6. Network collaboration environment and blockchain for auditing and accountability: Peer to peer (P2P) networks (such as the underlying network of Hyperledger systems) provide an attractive solution for data recovery capabilities and scalability, especially when combined with cryptographic technologies such as key sharing and multi-party computation. The consensus based general ledger mechanism of these blockchain systems provides a query (logging, auditing, and accounting) method for executing distributed repository data.
7. Social and economic incentives: In order to protect privacy data, share data proportionally, and enable a wide range of stakeholders to adopt data, we must incentivize individuals or organizations and infrastructure providers who possess "marginal data" from a social and economic perspective. These infrastructure providers are enterprises that provide peer-to-peer network scalability and efficient edge computing services, which provide real-time edge analysis and value compensation for data sharing status.



6、 The Model and Difficulties of Pricing Data Elements

The difficulty of pricing data elements

The value of data has high situational relevance, and pricing must be based on the scenario

Traditional price theory does not consider scenario factors, making it difficult to explain the pricing of data elements. The significant heterogeneity of data elements makes it difficult to have a unified pricing formula, and a "thousand people, one thousand prices" strategy needs to be adopted in different trading and application scenarios.

Data element transactions can be both data usage rights and data ownership

Unlike commodity transactions that require the transfer of ownership, data element transactions can be both data usage rights and data ownership, requiring the design of different transaction contracts for different transaction rights.

The complex externalities of data elements and extremely low replication costs

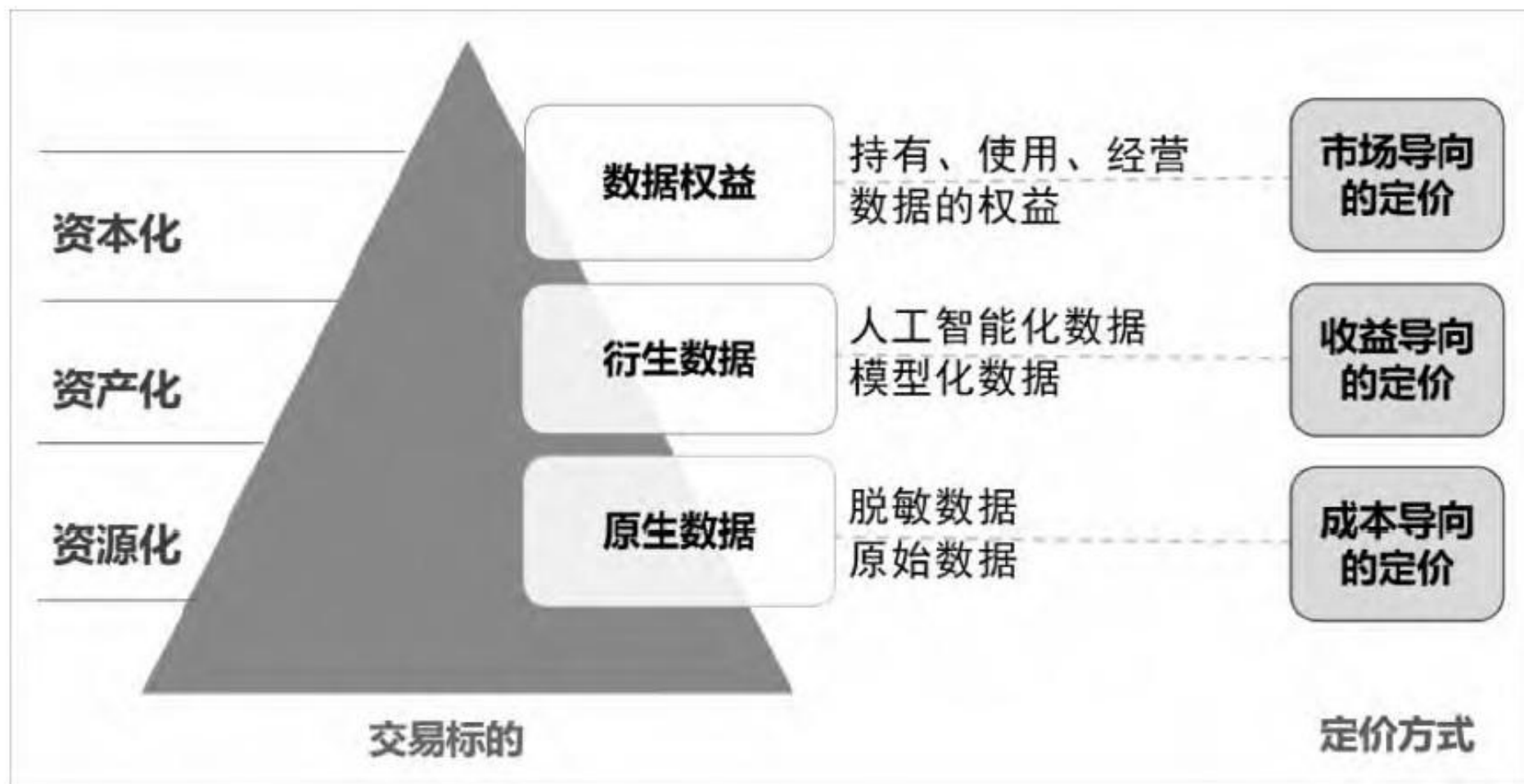
Many digital product services themselves are free, and in the vast majority of cases, they are completely non competitive, which increases the difficulty of valuation and pricing.

The production process of data elements is very complex, with numerous participating entities

The participating entities include buyers, sellers, consumers, enterprises, trading platforms, data service providers, third-party professional institutions, governments, etc. Reasonable division of interests among different entities also increases the difficulty of valuation and pricing.

Pricing Model for Data Elements

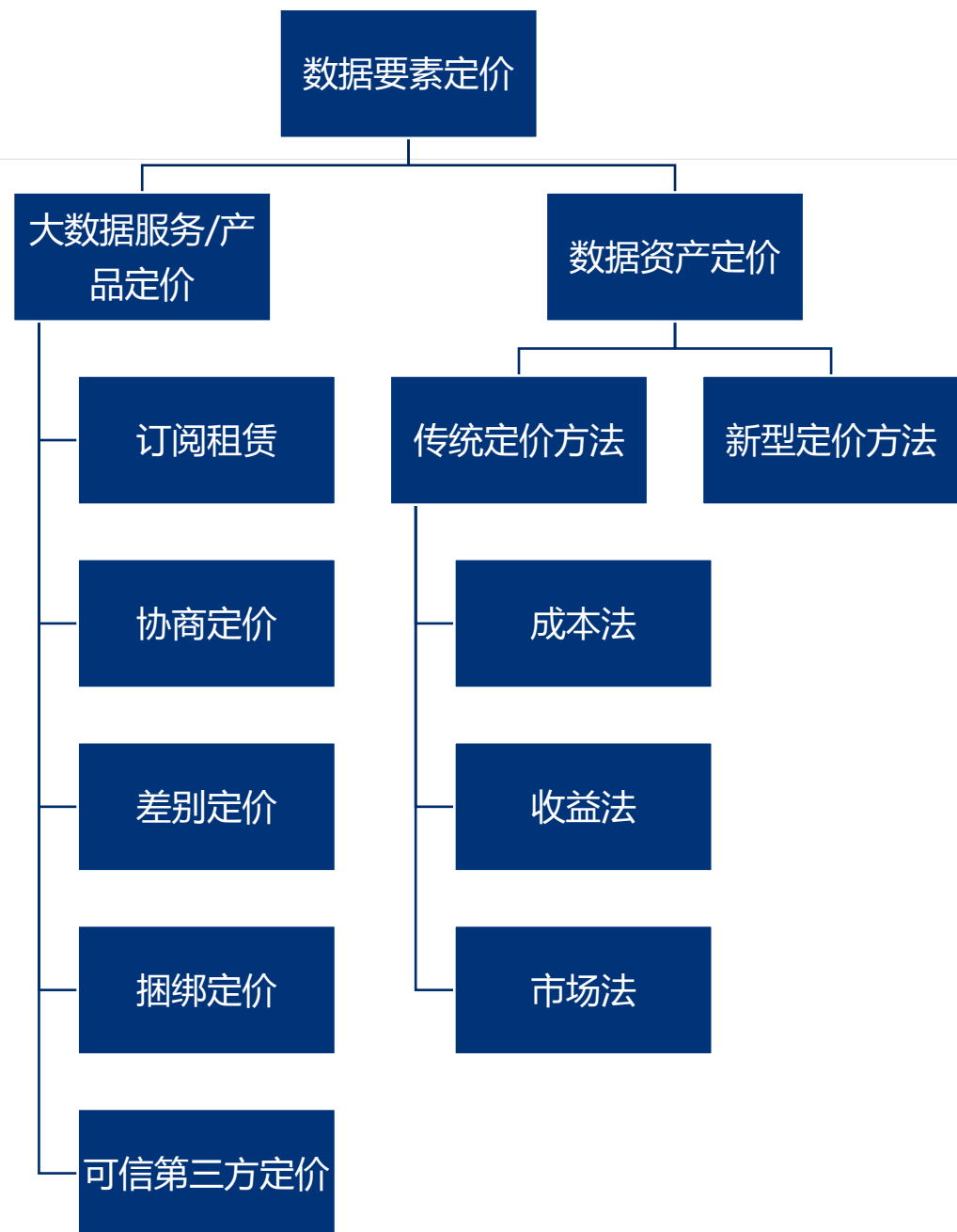
- Pricing models at the levels of data resource utilization, assetization, and capitalization



Source: Wang Jiandong (2023), Guangfa Securities Development Research Center

Pricing Model

- According to the object attributes of data element pricing, data element pricing includes pricing of big data services (products) and pricing of data assets.
- At present, the mainstream pricing models for big data services (products) on domestic and foreign big data trading platforms include subscription leasing, negotiated pricing, differential pricing, bundled pricing, and trusted third-party pricing. Among them, subscription leasing includes fixed pricing and per use pricing; Negotiated pricing includes auction pricing, feedback pricing, and free pricing; Trusted third-party pricing includes real-time pricing and automatic pricing.
- The pricing methods for data assets mainly include two categories: traditional pricing methods and new pricing methods.



Pricing Model - New Pricing Method

1

Optimization and Revision of Traditional Pricing Models for Data Assets

Introduce quantitative and qualitative methods such as Analytic Hierarchy Process, Grey Relational Analysis, Game Theory Analysis, Expert Evaluation Scoring Method, and Information Entropy Method to revise and refine the selection of influencing factors and weight setting for data asset value;

Introduce bankruptcy distribution method, real option method, etc. to more accurately estimate the future income and benefit distribution of data assets.

2

Organic integration and fusion innovation between traditional pricing methods for data assets

The data asset evaluation model jointly launched by Zhongguancun Shuhai Data Asset Evaluation Center and Gartner covers six sub models and is a comprehensive, all-round, and standardized data asset evaluation model.

3

Deep integration of data asset pricing methods and digital technology

Using artificial intelligence to adjust and modify the core variables and weight sizes in the data asset pricing model can help improve the accuracy and objectivity of the pricing model, and enhance the computational efficiency of pricing large-scale data products. Blockchain provides a complete and accurate record of data asset transactions.



7、 Typical examples and experiences of domestic and international data factor markets

Beijing Sub center Accelerates High Quality Development of Beijing Data Infrastructure System Pilot Zone

In order to implement the "Opinions of the Central Committee of the Communist Party of China and the State Council on Building a Data Infrastructure System to Better Play the Role of Data Elements" and the "Implementation Opinions of the Beijing Municipal Committee of the Communist Party of China and the Beijing Municipal People's Government on Further Accelerating the Development of the Digital Economy to Better Play the Role of Data Elements", and to deepen the implementation of the "Beijing Digital Economy Promotion Regulations", **the Beijing Data Infrastructure System Pilot Zone has launched in November 2023**. According to the "Beijing Data Infrastructure System Pilot Zone Creation Plan", by 2030, the Beijing Data Infrastructure System Pilot Zone will be fully established, with the strategic positioning of creating a policy highland, trustworthy space, and data factory for market-oriented allocation of data elements. We will adhere to the principles of leading by example, reform and innovation, and open cooperation, accelerate the gathering of high-value data resources, cultivate the data service industry, develop the data element market, and form a data element enterprise gathering highland,

Tongzhou District of Beijing has established a specialized team for the establishment of a data infrastructure system pilot zone, focusing on the main tasks and accelerating the construction of the pilot zone.

Main development measures

- (1) Build a cluster of digital economy industries such as cybersecurity and metaverse, forming a clustering effect.
- (2) Build a data headquarter and a cultural tourism data zone in Taihu Town to promote data circulation and innovative application scenarios.
- (3) Promote new infrastructure projects such as high-level zones of self-driving cars and smart imaging cloud platforms to enhance the level of digital infrastructure.
- (4) Launch implementation rules to support the development of the data element market, providing policy guarantees for promoting high-quality development of the data economy in Beijing sub center.

Shanghai Data Exchange leads the interconnectivity of the "Three Provinces, One City" data element market

The Shanghai Data Exchange is China's first important platform dedicated to promoting the circulation and market-oriented allocation of data elements. By establishing a transparent and secure data trading mechanism, it provides data trading and services for enterprises, governments, and various sectors of society, and promotes the process of data marketization.

The data management departments of Shanghai, Jiangsu, Zhejiang, and Anhui provinces and cities have thoroughly implemented the spirit of General Secretary Xi Jinping's important speech, held special meetings, and continued to promote the construction of the "One Network Office" in the Yangtze River Delta and the aggregation and sharing of public data, to facilitate the smooth flow of data and business, and to support the high-quality development of integrated government services in the Yangtze River Delta. In the past five years, the Yangtze River Delta region has continued to promote data flow and model innovation, and has embarked on a new path of integrated government services that does not break administrative subordination and administrative divisions.

(1) Promote the integrated development of data element markets. The Shanghai Data Exchange actively plays a leading and driving role, leading the interconnection of the "three provinces and one city" data element market, promoting the formation of a unified rule system around data property rights, circulation and trading, income distribution, security governance, etc., promoting the standardization of rules, product interoperability, and mutual recognition of data trading institutions in the Yangtze River Delta, and promoting regional integration development.

(2) Establish a system of rules. Publish a three-tier trading rule system consisting of "methods standards guidelines" to promote compliant data circulation and market-oriented applications. Activate the international board, establish a global cross-border data flow rule system, provide an efficient and secure framework for the international circulation of data, and assist in the development of the global digital economy.

(3) Provide a roadmap for tokenization of data assets. Propose a roadmap for tokenization of data assets, promote the transformation of data from resource based to asset based, and lay the foundation for future market-oriented transactions of data.

Guangzhou Data Exchange builds a full process data ecosystem

(1) Multi domain utilization of data elements

The data trading of Guangzhou Data Exchange covers multiple fields such as finance, intelligent transportation, and smart cities, and has achieved significant results in application scenarios such as intelligent transportation and financial risk control, providing strong support for the high-quality development of Guangzhou's digital economy.

(2) Promote high-quality development

1. Empowering the real economy and upgrading traditional industries

Empowering industrial manufacturing, modern agriculture, and commercial circulation through data elements to achieve digital upgrading of industries. Focusing on industries such as manufacturing, energy, and agriculture, building industry data spaces, improving industrial synergy capabilities, promoting secure data circulation and integrated innovation, and leveraging the multiplier effect of data elements.

2. Build a full process data ecosystem

Guangzhou Data Exchange collaborates with research institutions, industry associations, and enterprises to build a full process ecosystem covering data collection, analysis, and trading. Through collaborative innovation with partners, we continuously promote the diversification of data products and facilitate the prosperous development of the data market.

Marketization of EU data elements

(1) Strictly protect data property rights and establish a complete legal and regulatory system for data rights and interests

year	Title of the Bill	Content of the bill
1995	Personal Data Protection Directive	Contains 34 articles regulating personal data processing activities within the European Union.
1996	Database Directive (Database Directive)	Provide 15 years of exclusive rights protection for databases formed by large investments, preventing unauthorized third-party extraction and replication.
2018	General Data Protection Regulation (GDPR)	Standardize all global institutions that handle individual data within the European Union.
2019	Regulations on the Free Flow of Non Personal Data (FFD)	Ensure the free flow of non personal data within the EU and support commercial data processing.
2021	Data Governance Act (DGA)	Promote the reuse of public data, encourage paid sharing of data among enterprises, and support the use of data for public interest purposes.
2022	The Data Act	Refine regulations on data types, rights conflicts, and dispute resolution mechanisms.

(2) Establish a 'common data space' and innovate cross domain data sharing and exchange tools

The EU has created a 'common data space' as a concrete operating platform and tool, achieving interconnectivity among data spaces in ten major fields, building an ecosystem of mutual trust, providing data owners with tools to exercise their data rights, and creating a fair environment for data sharing and exchange.

Marketization of EU data elements

(3) Increase the scale of data supply and enhance the sharing of public and other data

Continuously expanding the openness and accessibility of public data, and continuously improving the level of data sharing and reuse.

(4) Raise the threshold for international exchange, enhance the discourse power and influence of global data circulation

The adequacy determination mechanism of the General Data Protection Regulation (GDPR) of the European Union has had a significant impact on personal information protection legislation and cross-border data flows worldwide. On the one hand, it attracts major economies around the world to join the EU's GDPR adequacy certification, and on the other hand, it forces major digital economies such as the United States to make compromises in personal data protection.

Thinking:

The EU's legal and practical exploration of data elements has brought positive and negative experiences to other countries. The establishment of legal systems for data elements, data rights protection laws, and common data spaces has set a learning benchmark for countries around the world, while the negative impact of strict data protection measures has also provided a warning for other countries.

(IV)

Construction of Smart Cities in China

Entering a new stage of global digital transformation

What is the comprehensive digital transformation of cities?



1、 Related policy documents

Guiding Opinions on Deepening the Development of Smart Cities and Promoting the Comprehensive Digital Transformation of Cities

Overall Layout Plan for the Construction of Digital China

The Proposal on Digital Transformation in the Outlook of the 15th Five Year Plan

Guiding Opinions on Deepening the Development of Smart Cities and Promoting the Comprehensive Digital Transformation of Cities

- In May 2024, the National Development and Reform Commission, the National Data Administration, the Ministry of Finance, and the Ministry of Natural Resources jointly issued the "Guiding Opinions on Deepening the Development of Smart Cities and Promoting Urban Comprehensive Digital Transformation". The opinions focus on promoting urban comprehensive digital transformation from five aspects: overall requirements, promoting urban digital transformation in all fields, enhancing urban digital transformation support in all aspects, optimizing urban digital transformation ecology throughout the process, and ensuring measures. The specific contents are as follows:
 - **2、 Promoting urban digital transformation across all sectors:**
 - (1) Establish a common foundation for urban digitalization
 - (2) Cultivate and strengthen the digital economy of cities
 - (3) Promote the integrated development of new industries and cities
 - (4) Promote precise and refined urban governance
 - (5) Enriching inclusive digital public services
 - (6) Optimize green, smart and livable environment
 - (7) Enhance the level of urban safety resilience.

Guiding Opinions on Deepening the Development of Smart Cities and Promoting the Comprehensive Digital Transformation of Cities

- **3、Comprehensively enhance the support for urban digital transformation:**
 - (8) Build and improve digital infrastructure.
 - (9) Build a data element empowerment system.
- **4、Optimizing the entire process of urban digital transformation ecology:**
 - (10) Promote digital institutional innovation.
 - (11) Innovative operation and maintenance model.
 - (12) Promote digital collaborative development.
- **5、Guarantee measures:**
 - (13) Strengthen organizational implementation. Fully leverage the inter ministerial joint conference system for the development of the digital economy, effectively strengthen organizational leadership, comprehensive coordination, and policy support. Each region should strengthen leadership, promote the implementation and effectiveness of various policies, measures, and key tasks, and eliminate digital "image projects". Encourage localities to strengthen financial support through various funding channels under the premise of legal compliance and controllable risks. Strengthen the construction of digital talent team and enhance citizens' digital literacy. Timely summarize the innovative measures taken by various regions to promote urban digital transformation, sort out replicable and promotable experiences, strengthen communication, share achievements, and promote them nationwide in a timely manner.

Overall Layout Plan for the Construction of Digital China

- The Overall Layout Plan for the Construction of Digital China "is a plan issued by the Central Committee of the Communist Party of China and the State Council in 2023, which proposes the overall framework for the construction of Digital China and marks the placement of the digital economy in a more important position. Building a digital China is an important engine to promote Chinese path to modernization in the digital era, and a strong support to build a new competitive advantage of the country. Accelerating the construction of a digital China is of great significance and far-reaching impact on the comprehensive construction of a socialist modernized country and the promotion of the great rejuvenation of the Chinese nation.
- The alignment between the overall framework and the direction of urban development: The overall framework of "2522" has been clarified, providing macro guidance for urban digital construction. Consolidate the "two foundations" of digital infrastructure and data resource system, promote the deep integration of digital technology with economic, political, cultural, social, and ecological civilization construction, strengthen the "two capabilities" of digital technology innovation system and digital security barrier, and optimize the "two environments" of digital development at home and abroad. The digital construction of cities needs to be closely integrated with the economic, political, cultural, social, and ecological civilization construction of cities within this framework, in order to support the comprehensive construction of a socialist modernized country.
- Empowering urban economic and social development: Integration of digital economy and real economy: Accelerate the innovative application of digital technology in key areas such as agriculture, industry, finance, education, healthcare, transportation, and energy in cities, promote the deep integration of digital technology and real economy, accelerate the digital transformation of urban industrial clusters, and cultivate and strengthen urban digital economy. Digital government: Cities need to accelerate the digitalization of government affairs, innovate institutional rules, strengthen digital capabilities, enhance digital service levels, promote online and offline integration, achieve efficient and convenient government services, and improve urban governance efficiency. Digital Culture: Cities should vigorously develop digital culture, strengthen the supply of high-quality network cultural products, promote the digital development of culture, combine urban cultural heritage and regional advantages, build digital cultural industry clusters, and create digital cultural brands with urban characteristics. Digital Society: Promote the inclusiveness of urban digital public services, develop digital health, advance the precision of digital social governance, popularize the intelligence of digital life, create a smart and convenient living circle, new digital consumption formats, and intelligent immersive service experiences, and improve the quality of life of urban residents. Digital Ecological Civilization: Promote smart governance of urban ecological environment, use digital technology to promote urban ecological environment protection and governance, accelerate the construction of a smart and efficient ecological environment information system, and advocate green and smart lifestyles.

The Proposal on Digital Transformation in the Outlook of the 15th Five Year Plan

- The period of the 15th Five Year Plan (2026-2030) is the first stage task to achieve the second centenary goal, and it is also a critical period for China to basically achieve modernization by 2035. In this special environment and mission, the importance of the 15th Five Year Plan is self-evident.
- In the outlook of the 15th Five Year Plan, the National Development and Reform Commission and relevant preliminary research projects in some regions highlight the relevant content of data element markets and urban digital transformation, which fully reflects the important position of cultivating data element markets and promoting urban digital transformation throughout the 15th Five Year Plan period.

The Proposal on Digital Transformation in the Outlook of the 15th Five Year Plan

- Related manifestations of the preliminary research projects of the National Development and Reform Commission
 - In the first batch of "15th Five Year Plan" research projects of the National Development and Reform Commission, multiple macro issues related to the digital economy were studied, such as the path and measures to strengthen, optimize and expand the digital economy. This shows the importance attached to the development path of the digital economy at the national level, and the cultivation of data factor markets and urban digital transformation are important contents of digital economy development.
 - The Comprehensive Department of Institutional Reform proposes to innovate the allocation of production factors to promote the development of new quality productive forces, focusing on cultivating new forms of factors, including data, and guiding various factors to collaborate and gather towards advanced productive forces. This reflects the emphasis on data elements and the idea of combining them with productivity development, providing direction for cultivating the data element market, that is, promoting productivity improvement through rational allocation of data elements, and thereby promoting urban economic development and digital transformation.

The Proposal on Digital Transformation in the Outlook of the 15th Five Year Plan

- Related manifestations of preliminary research topics in some areas
 - In the preliminary research project of the 15th Five Year Plan, Shanghai has conducted in-depth research on the goal of promoting urban digital transformation, including studying its ideas and key measures, which directly reflects the importance attached to urban digital transformation. Urban digital transformation covers all aspects of digital upgrading in the city, including infrastructure, public services, industrial development, and other fields.
 - In the early research project of the "Tenth Five Year Plan", Jiangsu has a research on the idea and measures of building a strong province with digital and real integration. The integrated development of digital economy and real economy is an important path for the city wide digital transformation. Through integration, industrial upgrading and innovation can be promoted. At the same time, data elements also need to play a key role in it. For example, in industrial Internet applications, intelligent manufacturing and other fields, data elements can improve production efficiency and product quality.



2、 Urban Global Digital Transformation: Concept and Connotation

The meaning of urban comprehensive digital transformation

- In recent years, China's smart city construction has developed rapidly and achieved phased breakthroughs, but it also faces problems such as insufficient urban integration planning and construction, and insufficient industrial city coordination and linkage. In addition, with the rapid development of digital technologies such as artificial intelligence, the value of data elements is increasingly prominent, deeply integrated and infiltrated with urban economy, society, and fields, driving China's smart city construction towards a new stage of "system reconstruction, quality and efficiency improvement" and comprehensive digital transformation.
- The so-called comprehensive digital transformation of cities refers to fully leveraging the role of data infrastructure resources and innovation engines, comprehensively enhancing the overall, systematic, and collaborative nature of urban digital transformation, using data integration and development to run through the entire process of urban planning, construction, management, service, and operation, reshaping the technological architecture of smart cities, systematically transforming urban management processes, promoting deep integration of industry and city, and promoting the comprehensive implementation of digital China construction in cities.



Overall requirements for the comprehensive digital transformation of cities

- By 2027, significant results will be achieved in the comprehensive digital transformation of cities across the country, forming a number of livable, resilient, and smart cities with horizontal and vertical connectivity and unique characteristics, which will strongly support the construction of Digital China. By 2030, the digital transformation of cities across the country will be comprehensively broken through, people's sense of gain, happiness and security will be comprehensively improved, and a batch of Chinese path to modernization cities with global competitiveness in the era of digital civilization will emerge.

Specific requirements for the comprehensive digital transformation of cities

- 1: Basic connotation: Adhere to one main line, focus on two directions, and grasp three requirements.
- Further analysis shows that promoting the digital transformation of the whole city should always adhere to the core line of "building a Chinese path to modernization city".
- Based on the two strategic directions of "digital upgrading and construction of cities and comprehensive empowerment of digital cities", we will promote the "digital renewal" of cities, provide a good fertile ground for the innovation and development of digital economy through "city leading industry", improve the digital economy ecology, and provide strong impetus for modern urban governance and high-quality development through "industry promoting city".
- At the same time, in the process of deepening the development of smart cities, the comprehensive digital transformation of cities should adhere to a systematic concept and effectively grasp the three basic requirements of "overall improvement, systematic optimization, and collaborative strengthening". Integrity refers to the comprehensive empowerment of the "Five in One" overall layout, promoting the overall improvement of new forms of digital economy, digital government, digital culture, digital society, and digital ecological civilization; Systematically establishing the awareness of "full cycle management", focusing on the organic growth path of urban planning, construction, management, and renewal, as well as the various links of industrial development production, distribution, circulation, consumption, and management, strengthening the interconnection, mutual support, and interactive feedback of the entire process, and carrying out systematic optimization of urban digital transformation; Collaboration refers to promoting efficient collaboration across departments, levels, ownership, industries, and fields, ensuring interconnectivity of data elements, and strengthening the interests of cities and people.

Specific requirements for the comprehensive digital transformation of cities

- 2: Main features, reflecting four transformations
- One is the transformation of facility construction from single point layout to integrated deployment. From the decentralized construction of hardware facilities and application systems in various departments to emphasizing common support, reducing resource waste, and coordinating the construction of a unified information infrastructure system such as government networks, cloud infrastructure, data platforms, and basic information databases, providing support for the development of personalized applications in various departments.
- The second is the transformation of service targets from typical scenarios to empowering the entire field and scene. Comprehensively promote the integration of digital technology with production and daily life, adhere to the guidance of the people and market demand, and increase the intelligent supply of daily life and active market entities for citizens.
- The third is the transformation of industrial development from improving the quality of the digital economy to promoting full industry openness and shared prosperity. Not only should we cultivate and strengthen the core industries of the digital economy, but we should also deeply implement the integration of digital technology with the primary, secondary, and tertiary industries, accelerate the transformation and upgrading of existing industries, lead and drive the extraordinary development of new industries and formats such as urban sharing economy, digital economy, intelligent economy, and platform economy, and further consolidate new driving forces for urban development.
- The fourth is to promote the transformation of the mechanism from single head management to cross regional and cross level collaboration. The construction of smart cities has shifted from single management of functions, resources, and responsibilities to holistic management of cross regional and cross level linkage, collaboration, and integration. It explores the establishment of standardized and orderly coordination mechanisms between provinces, cities, and districts vertically, as well as between departments, fields, and regions horizontally, to create a sustainable development model of diverse participation and win-win cooperation.

Specific requirements for the comprehensive digital transformation of cities

- 3 : Overall goal, achieve five "comprehensive" improvements
 - Resource 'global' coordination. The comprehensive digital transformation of cities requires the spatial and comprehensive planning of urban data facilities and information resources. We will comprehensively establish a unified basic support system for intelligent perception, cloud network environment, and urban brain, build a new foundation for intensive and shared smart cities, significantly improve the level of public data collection, sharing, application, circulation, and openness, make breakthrough progress in market-oriented reform of data elements, and basically eliminate various "information islands".
 - Service "panoramic" coverage. The comprehensive digitization of cities should serve the diverse production and living needs of the people and market entities in all aspects. A multi-channel, widely covered, proactive, intelligent, and personalized government service system, public service system, and ecological service system have been formed. The "one-stop" government service has been fully realized, and the business environment has been significantly optimized. The level of informatization in education, healthcare, elderly care, tourism, community and other fields has been significantly improved, and the supporting role of informatization in ecological environment, low-carbon environmental protection and other businesses has been highlighted.
 - New quality of the entire industry chain. The comprehensive digital transformation of cities should use digital technology to promote the continuous construction, supplementation, consolidation, and strengthening of industrial chains, forming a new and high-quality industrial ecosystem throughout the entire chain. Integrate urban technological innovation resources, promote revolutionary breakthroughs in digital technology research and application, accelerate the deep integration of digital technology with primary, secondary, and tertiary industries, and build a modern industrial system. The transformation and upgrading of traditional industries, the accelerated development of digital new industries such as "optical chip screen end network cloud intelligence", and the strengthening of new formats such as platform economy, sharing economy, and online economy, are comprehensively creating advanced productivity quality.
 - Collaborative governance throughout the entire process. The comprehensive digital transformation of cities requires the establishment of a multi-level, cross regional, cross system, cross departmental, and cross business linkage governance system. Comprehensive linkage command and disposal coverage have been achieved for various urban events, and "one network unified management" has been fully implemented in areas such as economic regulation, market supervision, social management, public services, and ecological environment protection, creating a number of digital governance model areas for cities and urban agglomerations.
 - Ensure the stability of all aspects. The comprehensive digital transformation of cities should form a comprehensive guarantee system that is guided by institutions, monitored as a means, and supported by safety. The institutional guarantee, operation and maintenance guarantee, and security guarantee for the full digitalization of cities are more comprehensive and perfect, achieving fair and standardized digital governance ecology, long-term and reliable digital operation and maintenance mechanisms, trustworthy and controllable digital security barriers, and promoting the benign and sustainable development of urban digitization.



3、 Case Study of Urban Global Digital Transformation

Beijing Cultural and Tourism Data Zone Creation Plan

Target:

- In response to the national "20 Data Articles" and Beijing's "20 Data Articles", Beijing has formulated the Beijing Cultural and Tourism Data Zone Plan, aiming to promote the deep integration of digital economy and cultural and tourism industry, utilize Beijing's data resource advantages, promote the transformation and upgrading of cultural and tourism industry, expand the supply of high-quality cultural and tourism data products, and enhance consumer experience.



Beijing creates a cultural and tourism data zone

- **specific methods**

- 1. The plan has completed the collection and release of the first batch of digital cultural and tourism scenes, including the "Ten Thousand Boat Parallel Collection" digital real integration cultural experience scene of the Grand Canal, the digital music, art and cultural audio-visual experience space scene, the Sanjiao Temple digital drama and tourism scene, and the Majuqiao agricultural cultural and tourism digital scene.
- 2. The plan involves visiting and researching a series of cultural and tourism related enterprises, integrating various cultural and tourism data resources, and providing data support for tourism planning, market analysis, and tourist services.
- 3. Established the Cultural Tourism Data Zone Innovation Alliance as the coordinating body for the Cultural Tourism Data Zone, focusing on management and operation, service cultivation, ecological construction, and other matters, proposing constructive opinions and innovative measures.
- 4. The plan involves the construction of a data zone, attracting market entities and multiple factors such as data, technology, and capital to participate. With the integration of government and enterprise data as the main line, a multi-level data element market will be built to promote the integration of government and enterprise data.

- **summarize**

- The Beijing Cultural and Tourism Data Zone showcases how to promote the digital transformation of the cultural and tourism industry by integrating data resources, building technology platforms, providing professional services, empowering application scenarios, and establishing institutional systems. The aim is to enhance the international competitiveness and regional driving force of the cultural and tourism industry, and provide a demonstration for its high-quality development.

Shanghai's urban digital transformation

Policy:

- Since the end of 2020, Shanghai has continuously strengthened the top-level design of its system and clarified the path of digital transformation. At the end of 2020, Shanghai issued the "Opinions on Comprehensive Promotion of Shanghai's Urban Digital Transformation", and later issued policy documents such as the "14th Five Year Plan for Comprehensive Promotion of Urban Digital Transformation", "Plan for Promoting Shanghai's Economic Digital Transformation to Empower High quality Development (2021-2023)", "Action Plan for Promoting Shanghai's Digital Transformation of Life to Build High quality Digital Life (2021-2023)", "Action Plan for Promoting Governance Digital Transformation to Achieve Efficient Governance (2021-2023)", and "Action Plan for Further Promoting the Construction of New Infrastructure (2023-2026)", establishing a relatively complete policy framework system for urban digital transformation.

上海市人民政府办公厅文件

沪府办发〔2021〕29号

上海市人民政府办公厅关于印发《上海市全面推进城市数字化转型“十四五”规划》的通知

各区人民政府，市政府各委、办、局：

经市政府同意，现将《上海市全面推进城市数字化转型“十四五”规划》印发给你们，请认真按照执行。

Shanghai's urban digital transformation

Specific methods:

- Economic digital transformation: Shanghai focuses on the construction of "five centers", activating the engine of digital industrialization, and stimulating the vitality of industrial digital innovation.
- Governance digital transformation: Shanghai promotes innovation in governance methods, models, and concepts through the integration and innovation of "One Network Office" and "One Network Management", and improves urban governance capabilities and levels.
- Digital transformation of life: Shanghai promotes digital transformation of life and creates high-quality living. This includes eight major tasks: optimizing new health services, exploring new growth spaces, creating new homes for living, cultivating new ways of transportation, leading new trends in culture and tourism, enriching new consumer experiences, building new models of assistance, and creating a new environment for digital accessibility.
- Digital transformation of infrastructure construction: Shanghai is strengthening the digital public supply of software and hardware collaboration, promoting the evolution of urban form towards digital twins, and achieving the "seven capabilities" of urban visualization, verifiability, diagnosability, predictability, learnability, decisiveness, and interactivity.

Amsterdam creates a virtual digital city

- In 1994, Amsterdam launched a virtual digital city project called "Digital City", which aims to provide citizens with a digital public space for free exchange and communication through the Internet.

Target:

- Create a community built and community driven Internet, and users become "citizens"

Project Content:

- Create virtual spaces such as public squares, post offices, cafes, etc., where users can freely express their opinions, discuss issues, and enjoy postal services and social venues similar to those in real life.
- Promote community participation: Promote user discussion and community sharing through channels such as user web pages and online forums.
- Cultural and technological exchange: Regularly hold online cultural activities to encourage users to share and exchange technical knowledge.
- Community management and decision-making: Encourage user autonomy, actively participate in community management, and participate in the formulation of important decisions through voting.
- Sustainable development: Promote environmental protection concepts, encourage users to participate in environmental protection projects, and participate in resource recycling and reuse.

Amsterdam creates a virtual digital city

Specific methods:

- 1. Organization and launch: co sponsored by De Balie and Hack TIC, the Cultural Center. Before the project was launched, a lot of technical preparations were made to ensure that users could access the Internet smoothly.
- 2. User participation and interaction: Users need to register as members of DDS in order to use various services and features. Encourage users to establish their own communities in virtual spaces and participate in various virtual activities, such as online chatting, forum discussions, etc.
- 3. Technological development and iteration: With the development of Internet technology, DDS constantly updates its technical platform to improve user experience. The project team regularly maintains and updates the platform to ensure the stable operation of the system and the security of user data.
- 4. Community Management and Support: Marleen Stikker has been appointed as the project chairman, responsible for overall project management and community development. The project encourages volunteers to participate in platform maintenance and content updates to ensure the sustainable development of the project.

• project

- The "Digital City" project is an important attempt of Amsterdam in the field of Internet and digitalization. Through Internet technology, the project provides citizens with a digital public space for free exchange and communication, promotes community participation and interaction, and has a profound impact on the subsequent construction of smart cities.

4、 Urban Renewal is an important opportunity for
urban development

Urban Renewal

		Sorting out Urban Renewal Policies		
time	Publishing institutions/conferences	file name	relevant content	
2013	the State Council	Opinions of the State Council on Accelerating the Renovation of Shantytowns	Shantytown renovation is a major livelihood and development project. We should focus on promoting the renovation of shantytowns in resource depleted cities, independent industrial and mining shantytowns, and areas with concentrated third tier enterprises, and steadily implement the renovation of urban villages	
2014	The Central Committee of the Communist Party of China and the State Council	National New Urbanization Plan (2014-2020)	We should follow the requirements of equal emphasis on renovation, renewal, protection, and restoration, improve the mechanism of old city renovation, optimize and enhance the functions of old cities, and accelerate the relocation and renovation of old industrial areas in urban areas	
2017	the State Council	Li Keqiang presides over the State Council executive meeting	The task of renovating 15 million sets of various shantytowns from 2018 to 2020 is the second three-year plan for shantytown renovation.	
2019	the Political Bureau of the Central Committee	Central Politburo Meeting	Implement the renovation of old urban residential areas, urban parking lots, and urban-rural cold chain logistics facilities to address shortcomings, and accelerate the construction of new infrastructure such as information networks	
2019	Ministry of Finance of the People's Republic of China	Management Measures for Special Funds for Central Financial Urban Affordable Housing Projects	The scope of special fund support includes public rental housing security and urban shantytown renovation, renovation of old residential areas, and development of the housing rental market.For the first time, the renovation of old residential areas has been included in the scope of support.	
2019	Central Economic Work Conference	The concept of "urban renewal" was emphasized for the first time	We need to increase housing security for urban disadvantaged groups, strengthen urban renewal and upgrading of existing housing, carry out the renovation of old urban communities, and vigorously develop rental housing.	
2020	General Office of the State Council	Guiding Opinions on Comprehensively Promoting the Renovation of Old Urban Residential Areas	By 2022, a basic framework, policy system, and working mechanism for the renovation of old urban residential areas will be established;By the end of the 14th Five Year Plan period, based on the actual situation in various regions, we will strive to basically complete the task of renovating old urban residential areas that need to be renovated before the end of 2000.	
2020	Central Economic Work Conference	2020 Central Economic Work Conference	Persist in expanding domestic demand, implementing urban renewal actions, promoting the renovation of old urban communities, and building a modern logistics system.We need to strengthen unified planning and macro guidance, coordinate industrial layout, and avoid redundant construction of emerging industries.	
2021	2021 Two Sessions	Premier Li Keqiang's Two Sessions Government Work Report	To implement urban renewal actions, improve the housing market system and housing security system, and enhance the quality of urbanization development.	
2021	The Central Committee of the Communist Party of China and the State Council	Outline of the 14th Five Year Plan for National Economic and Social Development of the People's Republic of China and the Long Range Objectives by 2035	Accelerate the transformation of urban development mode, coordinate urban planning, construction and management, implement urban renewal actions, and promote the optimization of urban spatial structure and quality improvement.Accelerate urban renewal, transform and enhance the functions of existing areas such as old residential areas, old factory areas, old blocks, and urban villages, promote the renovation of old buildings, and actively expand and build new parking lots and charging stations.	
2021	Ministry of Housing and Urban Rural Development	Opinions on Strengthening Green and Low Carbon Construction in County Towns (Draft for Comments)	Vigorously developing green buildings and building energy efficiency: promoting energy-saving renovation and functional improvement of old residential areas.	
2021	development and reform commission	Key Tasks for New Urbanization and Urban Rural Integration Development in 2021	Implement urban renewal actions.Promote urban renewal actions in the old city area, mainly focusing on the transformation of "three zones and one village" including old residential areas, old factory areas, old blocks, and urban villages.	
2021	Ministry of Housing and Urban Rural Development	Notice on Preventing Large scale Demolition and Construction in the Implementation of Urban Renewal Action (Draft for Comments)	Guide all regions to actively and prudently implement urban renewal actions, prevent the use of excessive real estate development and construction methods, large-scale demolition and construction, and the pursuit of quick success and instant benefits	

中央经济工作会议在北京举行

习近平李克强作重要讲话



- With the gradual stabilization of China's urbanization process, the space for people to make adjustments and optimizations is becoming increasingly narrow in large cities. The traditional development path of urbanization with outward expansion is no longer suitable for the goal of new urbanization. The interweaving of old and new contradictions in urban space and the increasingly strong desire of the people for a better life are all sending us a signal that Chinese cities are walking at a historic turning point.
- Adhere to the strategic basis of expanding domestic demand, implement urban renewal actions, promote the transformation of old urban communities, and build a modern logistics system. We need to strengthen unified planning and macro guidance, coordinate industrial layout, and avoid redundant construction of emerging industries.
- **In this situation, the concept of "Urban Renewal" was proposed.**

- The 14th Five Year Plan for National Economic and Social Development of the People's Republic of China and the Long Range Objectives Through 2035 outline the need to accelerate the transformation of urban development mode, coordinate urban planning, construction and management, implement urban renewal actions, and promote the optimization of urban spatial structure and quality improvement.
- Enhance the functions of existing areas such as old residential areas, old factory areas, old blocks, and urban villages, promote the renovation of old buildings, and actively expand and build new parking lots and charging stations. Complete the renovation of old urban residential areas, complete the renovation of old factory areas in big cities, renovate a number of large old blocks,etc.



中华人民共和国国民经济和社会发展第十四个五年规划和2035年远景目标纲要

2021-03-13 07:16 来源：新华社

【字体：大 中 小】

新华社北京3月12日电

中华人民共和国国民经济和社会发展第十四个五年规划和2035年远景目标纲要

第二十九章 全面提升城市品质

加快转变城市发展方式，统筹城市规划建设管理，实施城市更新行动，推动城市空间结构优化和品质提升。

第一节 转变城市发展方式

按照资源环境承载力合理确定城市规模和空间结构，统筹安排城市建设、产业发展、生态涵养、基础设施和公共服务。推行功能复合、立体开发、公交导向的集约紧凑型发展模式，统筹地上地下空间利用，增加绿化节点和公共开放空间，新建住宅推广街区制。推行城市设计和风貌管控，落实适用、经济、绿色、美观的新时期建筑方针，加强新建高层建筑管控。加快推进城市更新，改造提升老旧小区、老旧厂区、老旧街区和城中村等存量片区功能，推进老旧小区改造，积极扩建新建停车场、充电桩。

第二节 推进新型城市建设

顺应城市发展新理念新趋势，开展城市现代化试点示范，建设宜居、创新、智慧、绿色、人文、韧性城市。提升城市智慧化水平，推行城市楼宇、公共空间、地下管网等“一张图”数字化管理和城市运行一网统管。科学规划布局城市绿环绿廊绿楔绿道，推进生态修复和功能完善工程，优先发展城市公共交通，建设自行车道、步行道等慢行网络，发展智能建造，推广绿色建材、装配式建筑和钢结构住宅，建设低碳城市。保护和延续城市文脉，杜绝大拆大建，让城市留下记忆、让居民记住乡愁。建设源头减排、蓄排结合、排涝除险、超标应急的城市防洪排涝体系，推动城市内涝治理取得明显成效。增强公共设施应对风暴、干旱和地质灾害的能力，完善公共设施和建筑应急避难功能。加强无障碍环境建设。拓展城市建设资金来源渠道，建立期限匹配、渠道多元、财务可持续的融资机制。

第三节 提高城市治理水平

坚持党建引领、重心下移、科技赋能，不断提升城市治理科学化精细化智能化水平，推进市域社会治理现代化。改革完善城市管理体制。推广“街乡吹哨、部门报到、接诉即办”等基层管理机制经验，推动资源、管理、服务向街道社区下沉，加快建设现代社区。运用数字技术推动城市管理手段、管理模式、管理理念创新，精准高效满足群众需求。加强物业服务监管，提高物业服务覆盖率、服务质量和标准化水平。

第四节 完善住房市场体系和住房保障体系

Implementing Urban Renewal Action: Seizing the Historical Opportunity of Moving Cities Forward to Eliminate Diseases

- One is to obtain increment from the stock and achieve connotative development of the city
 - Urban renewal is to seek increment from the existing land in the city, rather than expanding the development of new land. The increment here mainly refers to two types of increments, one is the increment of buildings, such as the increase from low rise buildings to the current ten story buildings; More importantly, there is an increase in economic and social benefits. Without occupying rural land and arable land, urban renewal has achieved economic growth, increased employment opportunities, enriched residents' consumption, increased government tax revenue, and gained increment from the stock, thus realizing the connotative development of cities.
- The second is to benefit from efficiency and achieve low-cost and high-quality development of cities
 - Urban expansion and development not only require the occupation of new land, but also the construction of infrastructure in new areas, supporting public and service facilities such as kindergartens, schools, hospitals, and businesses, with a huge total investment. Updating some declining areas in the city can maximize the use of various mature supporting facilities. By reducing vacancy rates, increasing effective use area, introducing higher output industries, and attracting more consumer groups, the local economy can grow. Therefore, urban renewal can fully utilize the excellent supporting facilities, population and talent density, commercial district foundation, market size and other great location advantages in the core area of the city, and benefit from improving efficiency, achieving high-quality development of the city at lower costs.
- The third is to seek change in inheritance and achieve comprehensive improvement of urban functional environment
 - High level urban renewal is based on inheriting the urban context, history, and culture, combining traditional architecture with new industries and demands, while preserving the nostalgia, charm, and culture of the city, enhancing urban functions, improving the urban environment, and bringing valuable changes to the city. Therefore, developed countries pay special attention to the protection of urban texture in later urban renewal. The framework of streets and buildings remains basically unchanged, and only the internal functions and decorations of buildings can be changed. The characteristics of the city are obvious. There is a significant difference from the goals proposed by Chinese cities in the past, such as "one major change every three years" and "one minor change every year".
- The fourth is to seek development through innovation and achieve the transformation of old and new driving forces for urban development
 - The development of urban expansion does not require much innovation, just like painting on a blank sheet of paper, which can create various beautiful images. But if you want to renovate old buildings in the old city area, it's like building a dojo in a snail shell. It's difficult to do without innovation. For example, traditional office buildings in the past had low spatial efficiency, single functions, and although the rent was not high, the bosses and employees were unwilling to come. If traditional office buildings are upgraded to modern office buildings with technological content, high-end research and development enterprises, financial enterprises, and high-tech enterprises can be introduced to integrate the concepts of office, life, culture, green, and health. The urban industrial structure has been upgraded, thus achieving the transformation of old and new driving forces in the city.

Urban renewal is not about large-scale demolition and construction

Thank you for listening!

