**МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ**

**Західноукраїнський національний університет**

**Навчально-науковий інститут міжнародних відносин ім. Б.Д.Гаврилишина**
**Кафедра міжнародної економіки**

**Чжоу Лань**

# Цифрова трансформація економіки Китаю

спеціальність: 051 – Економіка

Випускна кваліфікаційна робота за освітнім ступенем «магістр»

Виконала студентка групи
ЕМЕма-11
Чжоу Лань
_____

Науковий керівник:
к.е.н., доцент О.С. Карась
_____

Роботу допущено
до захисту:

“___”_____ 20 ___ р.

Завідувач кафедри
_____ І. Я. Зварич

Тернопіль 2024

# АНОТАЦІЯ

Zhou Lan - Цифрова трансформація економіки Китаю – Рукопис.

Дослідження на здобуття освітнього ступеня «магістр» за спеціальністю 051 «Економіка», освітньо-професійна програма «Міжнародна економіка». Західноукраїнський національний університет, Тернопіль, 2024.

Дослідження присвячене теоретичним основам, аналізу та перспективам цифрової трансформації економіки Китаю. У роботі розглядаються поняття цифрової трансформації, глобальні тренди цього процесу та роль технологій штучного інтелекту; аналіз впливу цифрової трансформації на глобалізацію, інтеграцію цифрових технологій із реальною економікою та модернізацію традиційних галузей у Китаї. Висвітлюються переваги, виклики та рекомендації для прискорення цифровізації в економічній політиці Китаю.

# ANNOTATION

Zhou Lan - *Digital Transformation of China's Economy* – Manuscript.

A study for the degree of "Master" in specialty 051 "Economics," educational-professional program "International Economics." West Ukrainian National University, Ternopil, 2024.

The research is devoted to the theoretical foundations, analysis, and prospects of the digital transformation of China's economy. The paper examines the concept of digital transformation, global trends in this process, and the role of artificial intelligence technologies. It analyzes the impact of digital transformation on globalization, the integration of digital technologies with the real economy, and the modernization of traditional industries in China. The study highlights the benefits, challenges, and recommendations for accelerating digitalization in China's economic policy.

## TABLE OF CONTENTS

# INTRODUCTION

In the era following the pandemic, digital transformation has emerged as a crucial driver of global economic growth and a powerful force in reshaping the global value chains. At present, digital transformation is still dominant in developed countries and is driven by the service sector. Although countries have stepped up research and competition in digital transformation, there is no universal plan for digital transformation. Relying on moderately developed infrastructure, big data, and diverse application scenarios of digital technology, China has certain advantages in digital transformation. China must effectively implement policies to bolster basic skills, develop infrastructure, establish legal frameworks, safeguard small and medium-sized enterprises, cultivate digital talents, and adopt a digital transformation path tailored to the national context.

Digital technologies represent the cornerstone of the latest round of scientific and technological revolution. Furthermore, the digital economy has emerged as a significant driver for fostering high-quality economic development in the new developmental phase. From a macroeconomic perspective, according to calculations by the China Institute of Information and Communications.

**Object of the study**: The process of digital transformation of China's economy.

**Subject of the study:** The theoretical foundations, mechanisms, tools, and consequences of the digital transformation of China's economy, as well as its impact on traditional industries, globalization, and the socio-economic development of the country.

**Purpose of the study:** To analyze the theoretical and practical aspects of the digital transformation of China's economy, identify its advantages, challenges, and prospects,

and develop recommendations to accelerate this process.

**Scientific novelty:** The research reveals the features of the digital transformation of China's economy, particularly the integration of digital technologies into traditional industries, the role of artificial intelligence, and recommendations for improving digital policy in the context of modern challenges.

# CHAPTER 1: THEORETICAL FOUNDATIONS OF THE DIGITAL TRANSFORMATION OF THE ECONOMY

## 1.1 The importance of digital transformation

In 2020, the digital economy of 47 countries worldwide amounted to $32.6 trillion, constituting 43.7% of their GDP and experiencing a nominal growth rate of 3%, which significantly surpassed the global average decline of -3.363% during that year [1]. From a business standpoint, a 2023 UNIDO report reveals that manufacturing enterprises leveraging advanced digital technologies outperform other enterprises notably in monthly sales, annual profits, employment levels, and other economic indicators [2]. From the perspective of the division of labor in the global value chain, the development of digital factors is changing the structure, length and use form of global industrial supply chains: reducing the industrial chain, promoted by multinational companies for global distribution, and implementing regionalization, nearshoring and localization [3]; at the same time, it increased the proportion of technology and capital elements in the industry, reduced labor intensity in some industries, and changed the overall logic of industrial transfer in which labor costs have been central to decision-making since World War II. [4] From a global perspective, although the speed and depth of digital transformation are constantly increasing, there is a consensus on the profound integration of digital technology with the real economy, especially in the context of large-scale digital transformation efforts, the tertiary industry is still the main battlefield, and the paradox between digital development and sluggish economic growth has still not been resolved

[5]. This may be due to the spread of innovation and factors of individual heterogeneity of enterprises [6], the influence of productivity measurement errors [7], and the relationship that digital technologies are more dependent on investment in intangible assets [8]. and may also be due to the mode of industrialization and profitable industries of existing developed countries [9]. Although digitalization is considered a universal technology capable of revolutionizing the existing industrial organization, this transformation is still based on the existing principles of industrial organization and industry [10], and no new model has emerged. With its extensive industrial base, China holds a distinctive advantage in digital transformation. Leveraging China's existing industrial strengths and understanding its industrial trajectory in the global digital transformation process is crucial. Achieving an ascent in the value chain will not only facilitate the implementation of the new development concept but also aid in constructing a modern economic system and enhancing the level of supply chain modernization within the industrial chain.

The concept of digital transformation is closely intertwined with the digital economy. To gain insights into digital transformation, it is imperative to first comprehend the digital economy. The term "digital economy" was first introduced by Canadian Don Tapscott in the 1990s[11]. The flow of information represented by digital media was called “digital economy” and later gradually adopted by governments and global economic institutions to describe economics, science and technology, and economic changes and social problems caused by information technologies. Bay and Hicks divide digital economic activity into three levels: the first is the basic level (IT/ICT), the first level of industries

closely associated with digital technologies encompasses digital equipment manufacturing, the ICT services sector, and the telecommunications industry. The second level, with a more limited scope, includes e-commerce, digital services, and the platform economy. The third level, which is broader, comprises e-commerce, Industry 4.0, precision agriculture, the algorithmic economy, and more [12, 13]. In fact, in the 1980s, Toffler predicted in his book The Third Wave that information technology, represented by computers, would transform every aspect of economic life and forms of social organization [14].

Based on mechanization, informatization and networking, it uses various data to bring about digital transformation in social organization and production mode. From a micro-action mechanism perspective, digital transformation entails a series of changes grounded in digital technology, with data serving as the cornerstone. These changes involve the transformation of products/services and an overhaul of process optimization, aimed at achieving substantial enhancements in enterprise productivity and competitiveness[15]. Researchers across various fields offer diverse definitions and focal points regarding digital transformation. From an enterprise perspective, digital transformation not only alleviates information asymmetry, lowers transaction and logistics costs, and reduces labor expenses, but it also aids enterprises in enhancing their quality and performance [16]; Furthermore, it has the potential to transform the internal management mode of the enterprise, enabling a flat and networked organizational structure. This, in turn, fosters the development of a flexible, modular, and user-centric production mode [17]. With the use of digital technologies, the element mix in traditional

industries has changed, leading to changes in jobs and demand in various industries [18], as well as changes in the quality and availability of intermediate goods in many industries [19], thereby bringing about a large-scale adjustment of the industrial chain and industrial layout. From the perspective of value form, digital transformation facilitates deep integration of production and service links. This not only ensures the quality of the final product but also expands the value form, enabling consumers to actively participate in the entire production and service process[20]. An increasing number of scholars contend that digital technologies have altered the characteristics of product entry and production, giving rise to a novel form of social production organization known as the platform economy. Consequently, the digital economy is defined as a superior economic form that succeeds the agricultural and industrial economies [21].

Different researchers use different metrics for digital transformation. In a McKinsey study on the digital transformation of enterprises in China, researchers used Internet indicators to track the internal impact of digital transformation on the economy, and used the cost method to evaluate all production-related activities of Internet equipment, service provision, etc. Network applications, such as the scale of online retail, Internet penetration rate, smartphone penetration rate, enterprise cloud service penetration rate, Internet usage rate by SMEs, etc. [22]. Calvino et al. [23] Utilizing multidimensional indicators such as technology, market, and human capital, the intensity of various industries was measured. A specific set of indicators was chosen, including the proportion of investment in tangible and intangible ICT assets, the percentage of intermediate goods and ICT services purchased, the number of robots per hundred employees, the ratio of ICT professionals to

total employment, and the percentage of online sales to total sales. Cai Yuezhou and niu capital. In the non-digital sector, the value of data elements created by leveraging digital technology capital and the added value of synergies to provide effective insights were added, which also outlined the action path of digital transformation.

### 1.2 Global digital transformation process

2000 years ago: a digital transformation characterized by the “connectivity” of the Internet. From the late 1980s to the 1990s, computers became increasingly popular in the United States. In 1983, the computer usage rate in elementary schools in the United States was over 60% and in secondary schools over 85%, with an average of 10 to 11 computers per high school [25]. In the 1980s, exports of computers, semiconductors, and software were an important source of income for the United States [26]. China also officially joined the global Internet in 1994, joining the wave of global digital transformation [27]. People are discovering that the Internet and information technology can not only provide new contact information, but also significantly reduce search costs and reduce information asymmetries.

2000–2016: Digital transformation under the sign of “sharing, sharing and convergence”. At the dawn of the 21st century, digital transformation in the service sector has been steadily progressing. The initial wave of this transformation focuses on content products or services characterized by "sharing" and "collaborative consumption." Social media companies encourage users to happily "share" their emotions, stories, and more.

The advent of digital content providers and shared media platforms has digitized offline products such as music, books, and movies. Subsequently, services like Uber, Airbnb, Mobike, and Xianyu emerged, offering online car rentals, home stays, and second-hand goods trading, evolving content and services from mere "sharing" to broader "collaborative consumption." An increasing number of manufacturers are attempting to bolster user loyalty through the creation of "communities" and other innovative strategies [28]. The acceleration of the integration of the digital economy into the service sector is underway. Computer and electronic equipment manufacturers have become an important driver of the “convergence” of services in manufacturing. Digital content has begun to be integrated into newly developed electronic devices to provide services to consumers in the form of industrial products. The electronic equipment manufacturing industry led by multinational companies has spread throughout the world. On the other hand, IT companies have embarked on the path of digital transformation by actively opening up their hardware and software capabilities, thereby integrating digital technologies with secondary and tertiary industries. More and more manufacturing enterprises are increasing their production efficiency by purchasing digital services. The acquisition of digital services also reduces the cost of enterprises' independent investment in ICT infrastructure construction and saves social resources [29]. With the widespread influence of digital product software and hardware, the ability of enterprises to analyze and apply data has been greatly improved, and the importance of data is increasingly emphasized.

2016-today: Digital transformation shaped by platform and intelligence. Coupled with the increase in the number of users in various scenarios, the platform has become a

new carrier of products and services, forming a digital industrial ecology around the platform. This also requires the introduction of new characteristics through digital transformation: considering the platform as the basis of transformation and considering intelligence as the goal of transformation.

### 1.3 The role of the development of artificial intelligence technologies in the digital transformation of the economy

The swift advancement of artificial intelligence technology has furnished robust technical backing for China's industrial upgrading and transformation processes. Smart factories have realized automation, intelligence and transparency in the production process, greatly improved production efficiency, reduced energy consumption and costs, and ensured product quality and safety. This intelligent manufacturing model has not only driven the transformation and upgrading of the manufacturing industry but also facilitated the development of interconnected industrial chains, thereby infusing fresh momentum into the digital transformation of China's economy.

Artificial intelligence offers unique advantages in processing large multidimensional data, which can transform large amounts of data into valuable insights and provide decision support to companies in complex data environments. By using artificial intelligence, companies can more accurately understand market dynamics, optimize resource allocation, and improve operational efficiency. In addition, AI can help companies achieve intelligent supply chain management, reduce inventory costs, and

improve overall supply chain efficiency.

The progression of artificial intelligence technology has ushered in revolutionary changes to traditional industries through new formats such as intelligent customer service, intelligent writing, and intelligent Q&A. Additionally, this technology has fueled the growth of emerging industries like autonomous driving and intelligent finance, thereby opening up vast potential for the digital transformation of China's economy.

Small and medium-sized enterprises (SMEs) constitute a significant segment of China's economy, yet their digital transformation journey is fraught with numerous challenges. The use of artificial intelligence technology provides SMEs with a more convenient and efficient path to digital transformation. Through the use of artificial intelligence technology, small and medium-sized enterprises can realize intelligent control of production processes and improve production efficiency; at the same time, AI technology can also be used to optimize supply chain management and reduce operating costs. In addition, the government is actively promoting the digital transformation of SMEs and has released the Special Action Plan on Digital Empowerment of SMEs (2025-2027), which outlines key messages and main goals for promoting the digital transformation of SMEs in the next three years, including strengthening digital capabilities, issuing guidelines on the use of artificial intelligence for SMEs, strengthening application promotion, and improving SMEs' digital management and utilization capabilities.

# CHAPTER 2 ANALYSIS OF THE DIGITAL TRANSFORMATION OF CHINA'S ECONOMY

## 2.1 Digital transformation to promote globalization

The momentum behind digital transformation has broadened its scope, extending from Internet companies to diverse enterprise types and spanning from developed to industrializing and developing nations. In terms of the evolution of digital transformation, the initial two waves were predominantly led by Internet information companies and mainstream Internet enterprises, which fostered the emergence of search engines, globally renowned social media platforms, and e-commerce giants. Presently, the third phase is powered by the Industrial Internet [31].

From the perspective of participating countries, developed countries remain the main players in promoting digital transformation, but the power of developing countries is increasing; in particular, China's swift development in the digital economy has resulted in the formation of a "two-wheel drive" model within the digital economy, with developed countries (such as the United States) and developing countries (like China) serving as the dual engines of growth. According to statistics from the China Institute of Information and Communications, in 2020, the digital economy of developed countries amounted to 24.4*trillion*,*constituting*74.713.6 trillion, accounting for roughly 41.7% of the global digital economy, while China ranked second with 5.4*trillion*,*representingabout*16.62.33 trillion, or 71.39% of the global total; the value-added size based on future linkages was about $2.22 trillion, or 68.55% of the global total (see Figure 1). In 2015, the United States (28.64% forward linkages, 25.87% backward linkages) and China (11.32% forward

linkages, 11.58% backward linkages) topped the list in terms of digital economy size. China's transformation is particularly noteworthy. In 2005, China accounted for only 3.69% (backward linkages) and 3.19% (forward linkages) of the digital economy industry. The substantial growth in China's digital economy has emerged as a pivotal factor in reshaping the competitive landscape of digital transformation.

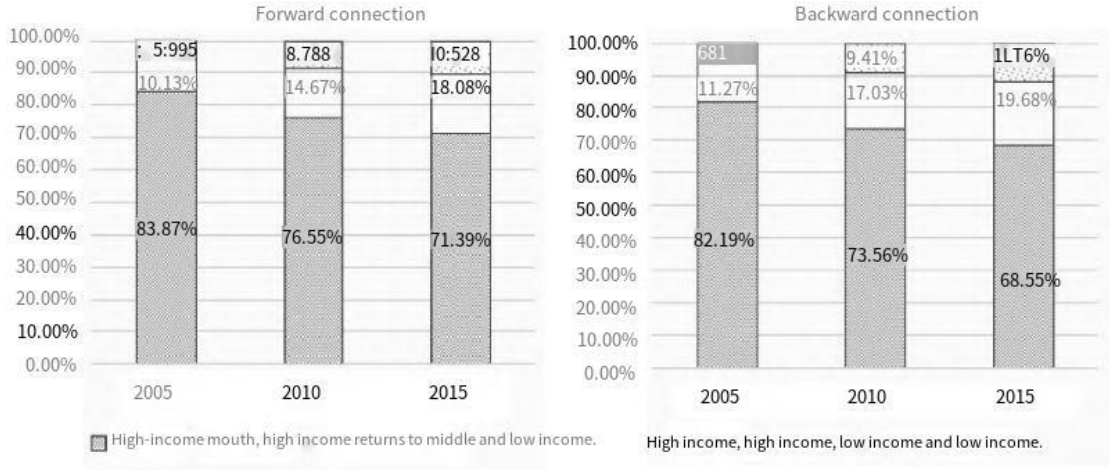



Figure 1 Share of digital economy sectors in countries with different income levels (unit: %) Source: World Bank database

In addition to changes in the scale of digital economic value creation, global technological competition in the digital field is mainly between the United States and China. According to WIPO statistics, China ranked first in the world with 68,720 patent applications in 2020, with Huawei being the largest patent applicant (5,464); Chinese companies BOE Technology (1,892) and Oper Mobile Communications (1,801) are also among the top ten applicants worldwide. The applications of these three companies accounted for 13.32% of Chinese applications this year. The United States ranks second with 59,230 patent applications in 2020, and Qualcomm for the Digital Economy (2,173)

was the largest U.S. applicant this year.

Digital technologies have accelerated changes in the global division of labor. As manufacturing shifts towards developed countries and the digital economy evolves, the ICT manufacturing industry presents a significant opportunity for developing nations in East and Southeast Asia, notably China, Vietnam, and Malaysia, to integrate into the global value chain. Table 1 shows the share of ICT products and services exported by several major Asian countries such as China. It can be seen that ICT product exports from China, Vietnam, Malaysia and the Philippines account for a significant share of the total product exports of these countries. India and the Philippines can also integrate into the division of labor of the global digital economy by outsourcing their software to developed countries.

Table 1.

Share of exports of ICT products and services from China and the major Southeast Asian countries (unit: %)

| | China | | Viet Nam | | Malaysia | | Thailand | | the Philippines | | India | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | product | service | product | service | product | service | product | service | product | service | product | service |
| 2010 | 29.12 | 5.87 | 7.91 | | 34.01 | 6.14 | 18.93 | one point three seven | 26.77 | 12.57 | 2.00 | 46.34 |
| 2011 | 26.76 | 6.92 | 11.64 | | 29.44 | 6.23 | 15.57 | 1.35 | 22.74 | 14.67 | 2.18 | 44.82 |
| 2012 | 27.06 | 8.06 | 18.24 | | 27.90 | 7.21 | 16.04 | 1.02 | 29.47 | 14.69 | 1.98 | 46.17 |
| 2013 | 27.42 | 8.26 | 24.54 | | 28.21 | 6.79 | 15.59 | 0.98 | 26.92 | 14.30 | 1.59 | 48.44 |
| 2014 | 25.94 | 9.21 | 23.97 | | 28.73 | 6.56 | 16.03 | 1.02 | 34.62 | 13.62 | 0.97 | 47.58 |
| 2015 | 26.56 | 11.29 | 29.37 | | 30.05 | 7.60 | 16.61 | 0.85 | 42.91 | 11.91 | 0.89 | 48.87 |
| 2016 | 26.50 | 12.20 | 31.24 | | 30.53 | 7.24 | 15.76 | 0.82 | 43.21 | 17.60 | 0.95 | 47.30 |
| 2017 | 27.07 | 12.66 | 33.45 | | 31.02 | 7.21 | 16.1 | 0.63 | 35.87 | 16.54 | 0.86 | 42.38 |

Source: World Bank database. Note: Spaces indicate missing statistics.

With the development of the digital industry, which leads to the improvement of production capacity and the supporting industrial chain, as well as the change in the proportion of production factors brought about by the advancement of digital technology,

the "near chain" and "short chain" of global value chains are gradually becoming possible [32]. Take the example of IT export (HS8471). In 2010, China and Mexico accounted for 78.67% and 8.21% of global exports, respectively. In 2019, the export share of China and Mexico increased to 78.36% and 18.21%, respectively. This means that Mexico has contributed a large proportion of computer production and support, and that Mexico directly borders the United States, which imported the largest proportion of computers that year (27.87%), which reflects "proximity". Based on the concentration of computer exporting countries, the top five countries accounted for 70.41% of total exports in 2010 and increased to 75.29% in 2019; the top 20 exporters accounted for 95% of the industry. Among import shares, the top five countries accounted for 49.18% in 2010 and 52.15% in 2019; the import share of the top 20 countries decreased slightly from 81.83% in 2010 to 81.68%. The same phenomenon occurred in terms of the import concentration degree and export share of the ICT industry in the service sector, but the concentration degree was slightly lower than that of the IT industry (see Table 2). This shows that in the manufacturing and service sectors related to the digital economy, production and imports take place in several large countries, mainly in the United States, China and Germany [33].

Table 2. Comparison of import and export shares of the IT sector and the ICT sector (unit: %)

| ranking | Import and export share of computer industry | | | | Import and export share of ICT industry | | | |
|---|---|---|---|---|---|---|---|---|
| | 2010 years | | 2019 | | 2010 years | | 2019 | |
| | export | Imported | export | Imported | export | Imported | export | Im |
| Top five countries | 70.41% | 49.18% | 75.29% | 52.15% | 43.60% | 35.36% | 49.33% | 41.59% |
| Top ten countries | 85.10% | 66.45% | 86.77% | 66.46% | 63.30% | 55.69% | 70.19% | 62.42% |
| Top 20 countries | 95.95% | 81.83% | 95.63% | 81.68% | 81.74% | 78.22% | 84.27% | 81.18% |

Source: Harvard University Atlas of Economic Complexity.

Judging from the degree of participation in the global value chain, the short chain phenomenon is particularly obvious in China's digital economy. Tables 3 and 4 show the global value chain value sources of the three sectors of China's digital economy calculated by forward and backward linkages respectively. We can see that the proportion of foreign value-added sources in the three sectors calculated by backward linkage has declined significantly since 2010, while the proportion of global value chains calculated by forward linkage shows signs of increasing; China's share of the value added of international trade in the field of computer, electronic and optical products D26 is decreasing year by year. From the perspective of direct linkage, this decline is mainly due to the decline in the share of traditional value-added sources in trade. This means that even if China's absolute size in the digital economy is increasing, the composition of value added has changed. The share of China's products and services imported from abroad in the three sectors of the digital economy is declining, while the share of domestic products and services used in domestic production is increasing. At the same time, this article compares data from the United States, Germany, Japan and South Korea over the same period and concludes that, with the exception of the United States, Germany, Japan and South Korea, South Korea has significantly increased the share of GVCs calculated by direct links with the D26 industry, a significant part of which is involved in the production of digital equipment in China and the other part is involved in the production of digital equipment in neighboring countries such as Poland, Hungary, Vietnam and the Philippines, which increased the share of foreign value-added in this industry and also

increased the demand for digital services in these countries. There are two main reasons for this situation: First, the strengthening of China's strong industrial support system and digital technological capabilities enables many production processes of intermediate products and services to be carried out domestically. Consequently, the proportion of foreign value-added in the backward linkages of these three industries will decline markedly, whereas the proportion of foreign value-added in the forward linkages of the two service industries within the digital economy will experience a slight increase; Second, the improvement and development of digital technologies and infrastructure have contributed to an absolute increase in demand for digital productions and services. This is true not only for countries such as China, which have significantly improved their capabilities, but also for countries such as Vietnam, the Philippines, Poland and Hungary, which are located in the central periphery of the region. Demand from these countries also contributed to foreign participation from Germany, Japan and South Korea. From a global perspective, with the increasing efforts of the United States and other developed countries to re-engage in manufacturing and adopt digital technologies, the trend of "short-chain" global value chains around the three major countries such as the United States and Germany and China will develop. are becoming more and more obvious.

Table 3. Share of different sources of the value chain in China, calculated on the basis of direct links (unit: %)

| industry | way | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D26 | GVC | 24.32% | 24.56% | 23.18% | 21.87% | 19.03% | 18.65% | 17.95% | 17.55% | 18.42% | 18.58% | 20.64% |
| | Traditional trade | 25.49% | 26.58% | 27.74% | 25.23% | 21.37% | 22.48% | 22.31% | 22.74% | 21.62% | 20.78% | 18.01% |
| D61 | GVC | 6.24% | 6.71% | 6.54% | 6.20% | 4.60% | 4.17% | 4.01% | 4.38% | 4.39% | 4.58% | 4.82% |
| | Traditional trade | 5.70% | 6.15% | 6.28% | 5.81% | 4.55% | 4.36% | 4.15% | 4.49% | 4.38% | 4.35% | 4.01% |
| D62T63 | GVC | 6.92% | 7.65% | 8.06% | 5.97% | 3.75% | 2.69% | 2.97% | 2.93% | 3.14% | 3.51% | 4.42% |
| | Traditional trade | 6.69% | 7.48% | 8.13% | 5.85% | 4.07% | 3.08% | 3.36% | 3.32% | 3.45% | 3.75% | 4.06% |

Source: Institute of Industrial Economics, Chinese Academy of Social Sciences.

Table 4. Share of value chain sources in China calculated by backward linkages (unit: %)

| industry | way | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D26 | GVC | 33.00% | 32.73% | 31.28% | 29.54% | 27.51% | 28.19% | 28.69% | 29.09% | 29.20% | 28.80% | 27.34% |
| | Traditional trade | 8.28% | 7.60% | 5.78% | 5.56% | 4.39% | 5.51% | 5.46% | 5.15% | 5.27% | 5.57% | 5.30% |
| D61 | GVC | 7.40% | 8.00% | 6.42% | 7.35% | 6.05% | 5.87% | 6.61% | 6.70% | 5.97% | 4.94% | 4.79% |
| | Traditional trade | 0.45% | 0.49% | 0.45% | 0.34% | 0.31% | 0.21% | 0.22% | 0.21% | 0.21% | 0.20% | 0.18% |
| D62T63 | GVC | 17.49% | 17.21% | 15.65% | 15.06% | 12.74% | 12.29% | 12.94% | 19.31% | 12.55% | 11.49% | 10.29% |
| | Traditional trade | 2.11% | 2.67% | 2.63% | 1.42% | 1.53% | 1.10% | 1.27% | 1.10% | 1.26% | 1.50% | 1.45% |

Source: Institute of Industrial Economics, Chinese Academy of Social Sciences.

## 2.2 How digital technologies and the real economy can be deeply integrated into the digital transformation is still being investigated.

In terms of industry progress, digital transformation is still driven by the service sector. Figure 2 shows the scale of value added by three sectors of the digital economy calculated from the perspective of a global value chain. We can see that the scale of the two branches of the digital economy related to the service sector is relatively large. This is related to the classification of digital technologies. The proportion of the service sector in the United States has always been high, and US exports mainly come from the service sector. In terms of leading companies, most of the world's largest digital technology companies are American companies, including well-known Internet companies in China. In terms of market value, these Internet companies are superior to traditional manufacturing companies.

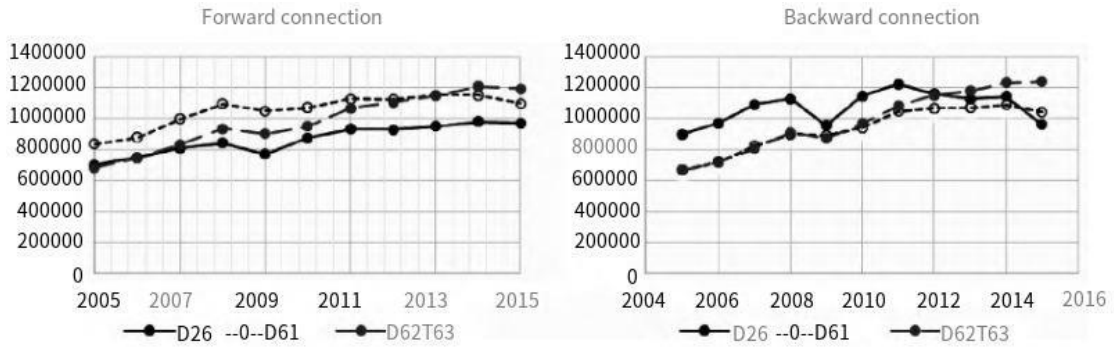



Figure 2. Development of the volume of value added in three sectors of the digital economy from 2005 to 2015 (unit: million USD)

Source: UIBE GVC indicator database, calculated by the authors.

Based on the progress of the transformation path, it can be observed that although digital transformation has advanced to its third stage, the industrial Internet holds the potential for achieving deep integration between digital technology and the real economy. However, currently, not all developed countries have discovered a robust and universally applicable digital pathway, and there is a need to enhance the level of deep integration between digital technology and the real economy. Table 5 – Table 7 shows the intermediate input demand for three sectors of the digital economy in manufacturing in the United States, Germany, Japan and China, calculated using an input-output table, and the trend of the share of intermediate input demand in manufacturing in total intermediate input demand. It should be noted that, first, in the computer, electronics and optics industry D26, the share of intermediate input demand in Germany and Japan is steadily declining, which is due to the fact that these two countries are the main exporters of intermediate goods and products in this industry, but the share of intermediate input demand in manufacturing in the three countries is relatively stable; On the other hand,

China has seen weak growth momentum. Compared with developed countries, China's intermediate demand in this sector is mainly invested in the manufacturing sector. Second, in the D61 telecommunications sector, the proportion of intermediate demand used in manufacturing is small in all countries, only Germany's share of manufacturing investment is increasing slowly. Third, in the computer and information services industry D62T63, Germany, Japan and China tend to increase the intermediate demand of this industry, and the upward trend in Germany is quite obvious; However, the proportion of manufacturing in intermediate demand has hardly changed, and the majority of intermediate demand comes from non-manufacturing. Fourth, from a national perspective, among the three industries of the digital economy in developed countries, Germany has the highest demand, with the manufacturing industry's intermediate demand for digital economy services being significantly higher than that of the United States; Compared with developed countries, China is still lagging behind in terms of digitalization and intermediate demand for IT and information services.

Table 5 Development of intermediate demand rates in the production of computer, electronic and optical products D26 in the most important countries (in %)

| country | United States of America | | Germany | | Japan | | China | |
|---|---|---|---|---|---|---|---|---|
| age | Intermediate demand Seeking rate | Manufacturing center Ratio of demand rate | Intermediate demand Seeking rate | Manufacturing center Ratio of demand rate | Intermediate demand Seeking rate | Manufacturing center Ratio of demand rate | Intermediate demand rate | Manufacturing center Ratio of demand rate |
| 2010 | 47.14% | 22.45% | 55.59% | 35.18% | 20.15% | 6.99% | 59.65% | 47.60% |
| 2011 | 48.59% | 23.67% | 51.44% | 34.20% | 22.59% | 8.11% | 61.93% | 48.22% |
| 2012 | 46.77% | 22.86% | 48.97% | 32.02% | 24.63% | 7.80% | 65.82% | 51.58% |
| 2013 | 48.54% | 23.82% | 45.58% | 30.06% | 25.29% | 7.80% | 69.18% | 53.88% |
| 2014 | 51.79% | 24.29% | 46.25% | 30.23% | 25.10% | 8.21% | 70.64% | 55.36% |
| 2015 | 52.24% | 25.55% | 44.71% | 29.62% | 26.01% | 8.60% | 69.74% | 54.75% |
| 2016 | 54.47% | 26.26% | 43.98% | 29.45% | 27.10% | 8.50% | 72.26% | 58.79% |
| 2017 | 57.75% | 25.75% | 45.62% | 31.20% | 26.57% | 8.72% | 69.54% | 58.13% |
| 2018 | 56.45% | 25.43% | 44.80% | 30.82% | 18.53% | 7.12% | 67.32% | 56.04% |

Source: OECD database, authors' calculations.

Table 6 Development of intermediate demand in the main countries of the telecommunications sector D61 (unit: %)

| country | United States of America | | Germany | | Japan | | China | |
|---|---|---|---|---|---|---|---|---|
| age | Intermediate demand Seeking rate | Manufacturing center Ratio of demand rate | Intermediate demand Seeking rate | Manufacturing center Ratio of demand rate | Intermediate demand Seeking rate | Manufacturing center Ratio of demand rate | Intermediate demand Seeking rate | Manufacturing center Ratio of demand rate |
| 2010 | 46.61% | 2.22% | 60.37% | 5.06% | 32.29% | 8.25% | 53.48% | 13.67% |
| 2011 | 46.21% | 2.08% | 59.13% | 4.55% | 33.35% | 4.83% | 58.09% | 8.41% |
| 2012 | 45.33% | 1.99% | 53.78% | 3.96% | 33.62% | 2.74% | 62.86% | 5.12% |
| 2013 | 45.35% | 2.08% | 54.19% | 4.13% | 32.94% | 2.47% | 63.81% | 4.79% |
| 2014 | 45.57% | 1.94% | 53.85% | 4.44% | 31.81% | 2.39% | 64.78% | 4.87% |
| 2015 | 45.79% | 1.73% | 64.23% | 6.54% | 33.60% | 2.57% | 66.20% | 5.06% |
| 2016 | 46.15% | 1.63% | 63.96% | 6.39% | 34.63% | 2.71% | 61.53% | 4.81% |
| 2017 | 46.93% | 1.74% | 63.79% | 6.39% | 33.65% | 2.69% | 58.88% | 4.70% |
| 2018 | 47.39% | 1.57% | 63.57% | 6.47% | 28.08% | 2.11% | 56.28% | 4.23% |

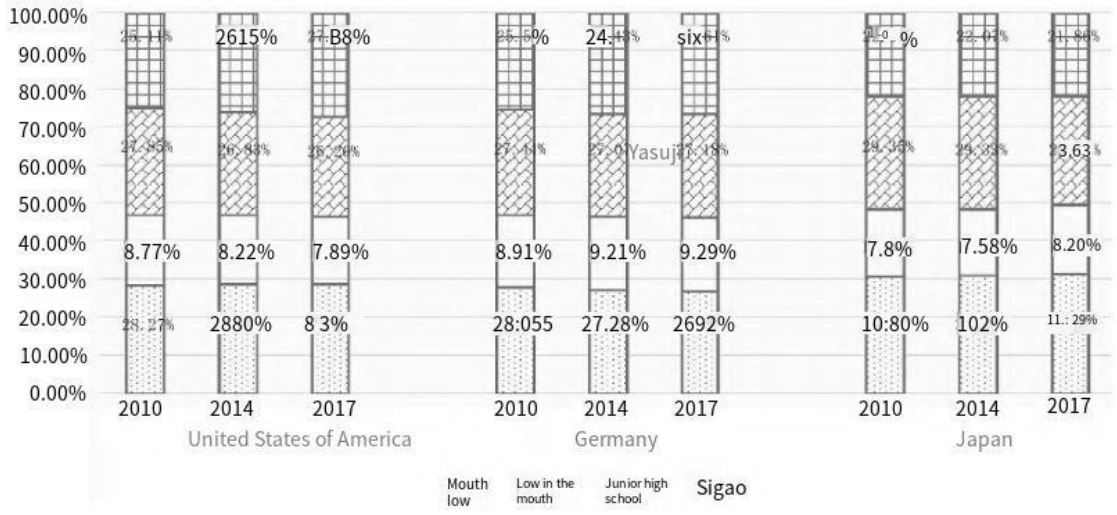
Source: OECD database, authors' calculations.

Table 7 Development of the average demand level in the main countries in D62T63 Computer and information services (unit: %)

| country | United States of America | | Germany | | Japan | | China | |
|---|---|---|---|---|---|---|---|---|
| age | Intermediate demand Seeking rate | Manufacturing center Ratio of demand rate | Intermediate demand Seeking rate | Manufacturing center Ratio of demand rate | Intermediate demand Seeking rate | Manufacturing center Ratio of demand rate | Intermediate demand Seeking rate | Manufacturing center Ratio of demand rate |
| 2010 | 59.35% | 3.66% | 76.36% | 11.22% | 43.97% | 20.03% | 24.21% | 11.03% |
| 2011 | 59.87% | 3.35% | 76.91% | 11.63% | 47.44% | 14.28% | 23.17% | 6.97% |
| 2012 | 59.49% | 3.33% | 84.36% | 12.88% | 46.58% | 10.43% | 21.60% | 4.84% |
| 2013 | 59.44% | 3.49% | 86.28% | 13.67% | 46.87% | 9.51% | 27.93% | 5.67% |
| 2014 | 60.81% | 3.52% | 84.38% | 12.68% | 49.83% | 9.81% | 30.27% | 5.96% |
| 2015 | 60.52% | 3.21% | 88.47% | 13.82% | 51.72% | 10.37% | 31.96% | 6.41% |
| 2016 | 60.33% | 3.10% | 91.55% | 14.60% | 52.21% | 12.34% | 32.40% | 7.66% |
| 2017 | 60.58% | 3.58% | 92.67% | 14.58% | 52.58% | 11.51% | 31.64% | 6.92% |
| 2018 | 59.22% | 3.64% | 93.28% | 14.72% | 56.10% | 12.91% | 36.77% | 8.46% |

Source: OECD database, authors' calculations.

As for digital intensity, in developed countries, the economic structure classified by digital intensity has not changed significantly between 2010 and 2017 (see Figure 3). According to the OECD classification of industrial digital intensity, most manufacturing industries have medium or high digital intensity, while in the United States, where manufacturing accounts for a relatively small share, there is a slight but insignificant decline in this category; compared with Japan, the combined shares of high, medium and high digital intensity sectors are slightly higher in the United States and Germany. First, it shows that the industrial structure of these countries has been relatively stable in recent years; second, it shows that the digital intensity of the sector does not undergo structural changes under the current classification standard. In practice, the level of automation in the manufacturing industry of developed countries is still high due to high labor costs. Although new production modes such as the "digital factory" and the "unmanned factory" are constantly being introduced, most of them are used in higher value-added industries (such as the automobile industry) or in factories producing high-end brands, which does not change the overall digital intensity of the industry. However, in the manufacturing industry, there are complex relationships between upstream and downstream industries, and there are many small and medium-sized enterprises. It is difficult for large enterprises to reproduce their digital transformation experience in upstream and downstream SMEs. The process of integrating digital technologies and the real economy is therefore relatively slow.




Rice. 3. Changes in the economic structure of the United States, Germany and Japan, measured by numerical intensity (unit: %)

Source: OECD STAN Industrial Analysis Database, compiled by the authors.

In the age of the digital economy, data has become a vital strategic asset. On the one hand, data entering the production function as an important production factor can improve the production process and optimize the organizational form, which can not only create a new industry, but also change the comparative advantage of the original industry. On the other hand, the large amount of data generated in personal activities, industrial activities and government activities, their ownership, right of use and privacy protection have become a unique new phenomenon of digital transformation. At the same time, the digital economy industry is also an industry with network effects. It is very easy to form a "winner takes all" [13] through the direct network effect, indirect network effect and cross-border network effect, and the rise of the platform economy has exacerbated this phenomenon. Especially in an infrastructure service platform (IaaS), it is very easy to form an oligopoly, forcing small and medium-sized enterprises to join the platform of

large enterprises. These issues not only pose challenges in digital transformation, but also become competitive points for countries that want to use laws and regulations to implement digital industrial organization. Therefore, in the future, regarding data and platform management issues, each country will do its best to formulate its own standards, which will bring unpredictable risks to digital companies in each country that want to participate in international competition.

### 2.3 Digital transformation of traditional industries in China

Currently, the primary contradiction in China's economic activities lies on the supply side, manifesting as excessive overcapacity and inadequate efficient supply. The offerings of enterprises fail to adequately meet consumer demands, making it challenging to achieve market-value production activities and foster a virtuous economic cycle. As for traditional industries, the main symptoms are low demand, unclear brand advantages, excessive competition, overcapacity and other increasingly visible problems.

Since the establishment of the People's Republic of China, China's manufacturing industry has achieved significant advancements. However, the majority of manufacturing enterprises still lag in development, confronting human, agricultural, technological, and other resource and environmental constraints, which collectively contribute to a continuous rise in overall costs. It can be seen that digital transformation can combine the advantages of manufacturing with networking and intelligence, which is beneficial to increasing production flexibility and precision and realizing flexible, green and intelligent

manufacturing.

The digital transformation of traditional industries constitutes a fundamental support for the expansion of the digital economy. The 2017 Government Performance Report advocated for "accelerating the rapid expansion of the digital economy," while the 2019 report reiterated the importance of developing the digital economy and emphasized the need to "bolster the digital economy." Currently, China's digital economy is on a high-speed trajectory. The development of the digital economy encompasses two facets: digital industrialization and industrial digitalization. Digital industrialization entails the innovation and commercialization of digital technologies, whereas industrial digitalization involves leveraging digital technologies for enterprise management and applying them to products and services. Practically speaking, traditional industries have become a crucial arena for the application and innovation of digital technologies, and their integration further fuels the rapid progression of the digital economy.

Cooperation in the industrial chain, from internal digitalization to platform expansion. These enterprises not only accelerate their own digitalization, but also enable SMEs to gain their own experience in digitalization practices by creating a platform that provides support for relevant upstream and downstream units. According to relevant statistics, China's industrial Internet extends to the aviation, petrochemical, steel, home appliance, clothing, machinery manufacturing and other industries, with more than 50 platforms - industrial Internet forms with industrial and regional influence. These platforms integrate and share production resources such as design, manufacturing and logistics, efficiently integrate data resources such as design, production and

manufacturing, equipment management and operation services, realize application innovation for different scenarios, and continuously develop the values of the space industry. It is worth noting that the digital transformation of traditional industries continues to encounter numerous difficulties and challenges, and there are complex and arduous issues that require resolution.

To effectively propel the digital transformation of traditional industries, we must embark on the following aspects:

Expedite the development of an effective digital technology supply chain; Accelerate the construction of a series of digital economic innovation platform supports, increase the level of technological innovation, and in particular effectively increase the level of innovation in original technologies and basic theoretical research; Develop and create a series of disciplines and specialty fields with strengths and characteristics, and bolster fundamental research in digital technologies, encompassing artificial intelligence, big data, and cloud computing; leverage the strengths of global talent and platform resources to expedite collaboration with top-tier research institutions and talent pools worldwide, organize and implement a series of large-scale scientific and technological research projects and demonstration project applications, and promote original research and development of digital and integrated technologies. Innovation; We will support enterprises to establish high-level enterprise technology centers with industrial influence , and support enterprises to actively participate in national “nose-to-nose” technology research in the digital economy, major scientific projects, the construction of scientific apparatus, etc. Formulation of international and national policies. Standards.

Focus on addressing the talent shortage in digital innovation. The first is to identify the capacity and quality standards of digital innovation talents. Based on a comprehensive consideration of talent needs in enterprises, this article identifies the professional skills of digital talents at all levels, as well as their skills in corporate management and risk management, etc., and promotes the integration of professional and technical digital talent technologies with various traditional industries. The second is to deepen the cooperation between schools and enterprises and between government and enterprises. Through the establishment of enterprise universities and enterprise training centers, colleges and universities are encouraged to provide relevant training courses according to the needs of market talents, thus laying a solid foundation for the development of talents in information technology and management. Third, promote the role of industry associations, educational institutions and consulting companies in the development of digital talents, and promote the formation of a digital talent development system. Fourth, actively create a conducive environment and explore effective and flexible policies for the introduction, training, utilization, evaluation, reward and retention of talents.

It is imperative to actively deploy a new generation of information infrastructure. Digital entities, exemplified by 5G, artificial intelligence, the Industrial Internet, and the Internet of Things, will constitute a significant component of the nation's new infrastructure. In response to the demand for industrial enterprise networks characterized by low latency, high reliability, and extensive coverage, we must expedite the upgrading of a new generation of information networks. Furthermore, we should strengthen the construction of emerging information infrastructure, such as the "Industrial Internet" and

"Cloud Computing," while ensuring the successful intelligent transformation of traditional infrastructure.

To bolster the digital transformation of traditional industries, it is crucial to strengthen policy support. This entails optimizing government services, refining policy precision, coordinating the research and development of pertinent policies and support measures, and integrating taxation, finance, human resources, and land-related policies to comprehensively advance the digital transformation.

In terms of taxation and financial support, special financial funds should be comprehensively planned, guiding financial funds at all levels to increase investment in the digital transformation. Moreover, support should be intensified for digital transformation platform projects and pilot demonstrations in the digital economy. The possibility of establishing a fund for the digital development of traditional industries should be explored, with state-owned industrial funds at various levels encouraged to set up sub-investment funds for digital economy development, in cooperation with social capital, adopting a market-oriented operational mode. Relevant preferential measures in the digital economy should be actively implemented to ensure their effective enforcement.

From the perspective of talent resources, the talent incentive mechanism should be improved, with support for equity incentives and incentives for the commercialization of scientific and technological achievements. Additionally, it is essential to enhance the optimal allocation and key guarantees of crucial resources, including land use, energy consumption, emissions, and innovation, in the digital transformation of traditional industries.

# CHAPTER 3 PROSPECTS AND CHALLENGES OF THE DIGITAL TRANSFORMATION OF CHINA'S ECONOMY

## 3.1. Benefits of China's Digital Transformation

A variety of application scenarios and a diverse industrial ecology are emerging. China has a large population and a comprehensive industrial range. The application cases for digital transformation are very diverse. The market demand for digital transformation is relatively stable, which is beneficial for digital applications and green industrial construction. In 2021, there were 1,032 million internet users in China, with an internet penetration rate of 73.0%. The large number of internet users has become the basis for online consumption and common economic development. In terms of enterprise demand, according to the "China Chemical Industry Integration Data Map (2018)", in 2018, the proportion of enterprises in the initial construction of the digital transformation of Chinese manufacturing enterprises was 27.4%, and the proportion of enterprises in the unified construction of the digital transformation of Chinese manufacturing enterprises was 27.4%. The coverage was 50.2%. Most enterprises, especially SMEs, have just started digital transformation, and the demand for digital software and hardware is high. Our country has a comprehensive range of industries, which contributes to the formation of different types of ecological circles with different industries such as industrial Internet, automobile networks, etc., which constitute a diverse industrial ecology composed of different types of industries.

The diversification and volume of data have become new industrial advantages of our country. Statistics released by the China Institute of Information and Communications

indicate that the size of China's cloud computing market will amount to 209.1 billion yuan in 2020. With the increasing demand for digital transformation of enterprises, the data generated by cloud services and edge computing will continue to increase. This will also generate more production data that can be used. Beyond the enterprise level, personal travel data, medical data, traffic data, etc. have become important resources to support the construction of smart cities in our country. China has also stepped up its efforts to build a digital hub. In 2022, it began to implement an "east-west census strategy" to help government and enterprises move data centers and computing power to central cities, which will help China build a more competitive data industry.

A well-developed infrastructure positions China to capitalize on development opportunities in the digital economy era. Regarding the construction of the 5G network, China boasted 1.43 million 5G base stations in 2021, providing coverage to all prefecture-level cities. The recently published "Three-Year Action Plan for the Development of New Data Centers (2021-2023)" by the Ministry of Industry and Information Technology outlines China's plan to establish ultra-large new data centers both domestically and internationally. The advancement of cutting-edge digital infrastructure has emerged as a pivotal pillar supporting China's digital transformation.

### 3.2 Obstacles to China's digital transformation

There are “short boards” in important core technologies. China's digital transformation lacks sufficient capabilities in key technologies and faces the threat of "supply cuts" from developed countries. Especially in key industrial software, core operating systems, embedded chips, development tools, high-end sensors and other technical fields, it is mainly monopolized by developed countries such as the United States. Even in China's leading AI field, unicorn products and profitable technologies in China are mainly concentrated in the application layer. The number of companies developing core chips and processors is relatively small and their capabilities are relatively low, which increases the risk of China's digital transformation in the future. In addition, the large sums spent on purchasing foreign technologies will also increase the transformation costs of domestic companies.

Small and medium-sized enterprises, which are vital and dynamic components of the digital economy, face challenges in effectively and swiftly undergoing digital transformation due to constraints in capital, resources, and awareness. When it comes to data protection, some small and medium-sized enterprises are not sufficiently aware of network security, which can easily lead to data leakage; some SMEs have no confidence in the data security of industrial Internet platforms and are unwilling to engage in digital transformation. Some SMEs are also willing to adopt data technology, but compared with platforms, SMEs have a weak voice and are vulnerable to arbitrary price increases and limited technological capabilities of platform companies. All of these require the state to provide clear policies to protect the rights and interests of small and medium-sized

enterprises.

Lack of favourable employment policies and training systems compatible with digital transformation. Generally speaking, in the process of economic structure transformation, a certain degree of structural unemployment will occur, especially in China, a country with a very rich labor population. Digital transformation may lead to large-scale "machine replacement." The contradiction between digital transformation and short-term job losses needs to be mitigated through employment policies. In addition, our country's current labor force structure has a large number of unskilled digital workers scattered across many sectors of the real economy. At present, digital education programs only exist at the youth level, and there is no digital transformation training in vocational education and on-the-job training. This has exacerbated the risk of structural unemployment in the process of digital transformation.

### 3.3 Accelerating the transformation of China's digital policy recommendations

Complete the short table and improve basic numerical skills. First, in areas that are easy to get stuck, the country's entire system should be adopted to intensify scientific research and solve key problems. Priority should be given to solving key obstacles that affect China's digital transformation, such as chips, high-performance sensors, and industrial software. The localization process should be accelerated. At the same time, a risk plan should be drawn up for the "section" of key technologies. Second, in a competitive environment, the market should play a decisive role in allocating resources,

create a policy environment that "tolerates trial and error and encourages innovation", and encourage enterprises to develop and implement basic digital technologies and advanced technologies through policies such as finance, taxation, land, and the establishment of venture funds. Third, by building key government laboratories, regional innovation centers, and technology incubators, industry-university research will create a platform for cooperation, promote the development of general and core technologies, and provide enterprises and intellectual property rights and incentives for university researchers. funds and other incentives.

Strengthening the creation of digital infrastructure to reduce the digital divide between regions. Digital infrastructure is the key to digital transformation. China must further increase its investment in digital infrastructure to achieve equalization of digital infrastructure coverage across regions. First, China should further expand infrastructure construction such as 5G, increase investment in digital infrastructure in underdeveloped regions, and narrow the infrastructure coverage gap between regions. Second, based on the differences in digital technological capabilities between the eastern and western regions, implement differentiated digital infrastructure development policies to transport government data and high-end IT data with low demand to data centers in western regions, and build cutting-edge data centers in western regions. eastern regions. Third, we must push forward the promotion of satellite internet, 6G and other new digital infrastructure to ensure that they do not lag behind other developed countries in infrastructure. Fourth, we will support and encourage large Internet companies to build large data centers, encourage large Internet companies to "go out" and plan to build large data centers in

other countries, expand the capabilities of cloud services and data algorithms, and improve the competitiveness of our Internet companies.

Enhance research efforts on data laws and regulations to guarantee the security of the data supply chain. Pay close attention to relevant data from the European Union and the United States and policy trends in the platform economy, and achieve good results in policy research and research. Actively participate in the development of relevant international standards, take the opportunity of economic and trade agreements to expand the scope of application of Chinese standards, and ensure the anticipation and internationalization of laws and regulations in China. At the same time, the bank is actively developing laws and regulations on issues such as data security, cross-border data flows, and platform antitrust policies. Guided by the principle of safeguarding consumers' right to information and the confidentiality of personal data, the bank fostered the processing and responsible utilization of data, thereby promoting the growth of big data enterprises. Simultaneously, there is a need to reinforce data security risk management by establishing a multi-tiered and multi-faceted data security protection system tailored to various industries and data classifications, and integrating data supply chain security into the overall industrial supply chain security framework.

Increase support for SMEs and monitor platform behavior in accordance with regulations. First, it pays special attention to protecting small and medium-sized enterprises, and encourages small and medium-sized enterprises to "move to the cloud", "instill wisdom" and "leverage numbers" by allowing them to build data centers on the Industrial Internet to support small and medium-sized enterprises that use the cloud to

manage their daily businesses, and provide certain financial and financial subsidies for SMEs that implement digital infrastructure to alleviate the financial pressure of digital transformation. Second, it should protect the data privacy of SMEs and the security of customer resources, address the challenges of technology, talent and resources in the digital transformation of SMEs through industry alliances and other forms, and encourage industry leaders to contribute to managing the digital transformation of affected small enterprises. Third, different types of Internet platforms are subject to different supervision, and traffic platforms and platforms that provide infrastructure and services to the real economy are subject to different supervision, so as to create an optimal ecological environment for the transformation of small and medium-sized enterprises. Enterprises.

Improve everyone's digital skills and develop digital talent. While advancing digital transformation, we will also bolster the digital workforce by giving special attention to the impact of digital transformation on the labor market and ensuring digital learning opportunities for everyone. The first is to regularly conduct surveys and statistical surveys on the digital culture of the entire population, and develop and plan appropriate digital courses on this basis; the second is to provide training opportunities for vocational skills related to digital transformation, focus on training workers in the workplace, provide regular digital skills training courses for workplace personnel, and improve the assessment of local governments to produce skilled digital skills. digital workers. Third, courses related to information technology will be included in the textbooks of universities, high schools and elementary schools, and career planning and career guidance related to digital transformation will be included in university courses; We will increase the supply

of vocational schools and encourage vocational schools to provide digital skills courses for all ages.

## CONCLUSIONS

After conducting thorough analysis and research, this article presents a comprehensive exploration of China's economic digital transformation. From the broader macroeconomic landscape to the minute details of entrepreneurial endeavors, and from policy backings to technological advancements, digital transformation has emerged as a pivotal force driving China's high-quality economic development. Here are the key insights gleaned from this study:

With the swift evolution of information technology, the digital economy has transformed into a novel catalyst for global economic expansion. Amidst the constraints posed by traditional development models, resource limitations, and environmental challenges, China's economy demands urgent industrial upgrades, structural refinements, and efficiency enhancements through digital transformation. This transformation not only boosts production efficiency and cuts operational costs but also fosters innovation, amplifies competitiveness, and injects fresh vitality into the Chinese economy.

China's municipal governments have placed significant emphasis on digital transformation, issuing a suite of policies and measures to cultivate a conducive institutional environment and provide robust policy support for the digital economy's growth. These policies encompass infrastructure development, data security safeguards, intellectual property protection, personnel training, and more, offering a holistic and multifaceted assurance for digital transformation.

Technological innovation stands as the cornerstone of digital transformation. The widespread adoption of next-generation information technologies, including cloud

computing, big data, artificial intelligence, and the Internet of Things, furnishes potent technical support for this transformation. These technologies have not only catalyzed the transformation and upgrading of traditional industries but also spurred the emergence of diverse new industries and business models, unlocking unprecedented prospects for the Chinese economy.

Numerous companies have made substantial strides in digital transformation, achieving growth and efficiency gains through process optimization, product quality improvement, and sales channel expansion. However, digital transformation is not a swift process, and companies confront numerous practical challenges, such as technology selection, data security, and talent scarcity. Therefore, companies must consistently escalate investments, intensify technological research and development, and personnel training and education to continually enhance their digital transformation capabilities and proficiency.

Looking ahead, China's economic digital transformation will continue to intensify and broaden. The government should further refine the policy framework, augment oversight and coordination, and cultivate a more conducive environment for digital economy development. Enterprises should actively embrace digital transformation, strengthen technological innovation and personnel training, and relentlessly enhance their competitiveness. Meanwhile, all sectors of society should collectively engage in fostering deep integration between the digital economy and the real economy, realizing China's high-quality economic development.

China's economic digital transformation has yielded notable accomplishments, yet it

necessitates ongoing endeavors. With the concerted efforts of policy support, technological innovation, and entrepreneurial endeavors, China's economic digital transformation will continue to scale new heights, contributing Chinese wisdom and prowess to global economic development.

## REFERENCES

[1] China Institute of Information and Communication. White Paper on the Global Digital Economy – A New Dawn of Epidemic Recovery (2021) [R/OL].

http://www.caict.ac.cn/kxyj/qwfb/bps/202108/P020210913403798935 7.

[2]UNIDO. Industrial Development Report 2022: The future of industrialization in a post-pandemic world[R]. United Nations Industrial Development Organization 2021: 83-84.

[3] Sheng Chaoxun. Ideas and strategies for promoting safe and sustainable development of the industrial supply chain under a new development model [J]. Reform, 2021, (2): 1-13.

[4] Li Wenxuan. The new industrial revolution and rethinking comparative advantage[J]. Economist, 2019(5):76-84.

[5] Eric Brian Joffson, Daniel Locke, Senator of the Chadian Citizens. Artificial Intelligence and the Paradox of Modern Productivity[J]. Comparison, 2019(1):120-155.

[6] EM Rogers. Diffusion of Innovations [M]. Tang Xintong, Zheng Changqing, Zhang Yanchen, translation. Beijing: Electronic Industry Press, 2021.

[7]FATIH, GÜVENEN, RAYMOND et al. Offshoring profit transfer and domestic productivity measurement[J].

[8] Jonathan Haskell, Stian Westlake. The Growth of the Intangible Economy [M]. Xie Xin, translation. Beijing: CITIC Publishing House, 2020.

[9] Joint Project Group on Creating New Advantages of Digital Economy. An In-Depth Comparative Study of Digital Economy in the World's Leading Countries[R].

Tencent Research Institute, 17.12.2021.

[10] United Nations Industrial Development Organization. Industrial Development Report 2020: Industrialization in the Digital Age [R].2019.

[11] TAPSCOTT, DON. Digital Economy: Prospects and Threats in the Age of Networked Intelligence [M]. New York: McGraw-Hill, 1996.

[12] BUHT R., HICKS R. Definition, conceptualization and measurement of the digital economy[Z]. GDI Developmental Informatics Working Papers, No. 68, 2017.

[13] Li Xiaohua. New characteristics of digital economy and formation mechanism of new kinetic energy of digital economy[J]. Reform, 2019(11):40-51.

[14] Alvin Toffler. Third Wave [M]. Huang Mingjian, translation. Beijing: CITIC Publishing House, 2018.

[15] Xinhua University. The Road to Digital Transformation [M]. Beijing: Machinery Industry Press, 2019.

[16] REINARTZ. Digital transformation and value creation: major changes are imminent[J]. GfK Marketing Intelligence Review, 2017, 9(1):10-17.

[17] Qi Yudong, Xiao Xu. Corporate reform in the era of the digital economy [J]. Management World, 2020, 36(6):135-152+250.

[18] Deng Zhou, Huang Yang. Research on the impact of artificial intelligence development on employment [J]. Learning and Exploration, 2019,(7):99-106+175.

[19] MIRUDO, SÉBASTIEN and CADESTIN. Services in global value chains[J]. OECD Trade Policy Papers 2017: 197.

[20] Intelligent Economy Research Group, Institute of Industrial Economics, Chinese

Academy of Social Sciences. Intelligence+: Intelligent Transformation of Manufacturing Industry [M]. Beijing: People's Press of Posts and Telecommunications, 2021.

[21] Pei Changhong, Ni Jiangfei, Li Yue. Political-economic analysis of the digital economy [J]. Finance and Business Economics, 2018, 39(9):5-22.

[22] Hua Qiangsen et al. Digital Transformation in China: The Impact of the Internet on Productivity and Growth[R]. McKinsey Global Institute, 2014.

[23] CALVINO et al. A taxonomy of digitally intensive sectors[J]. OECD Science, Technology and Industry Working Papers 2018, No. 14.

[24] Cai Yuezhou, Niu Xinxing. Large-scale measurement and structural analysis of the added value of China's digital economy [J]. Social Sciences of China, 2021(11):4-30+204.

[25] Hu Hong. Introduction to the popularization of computer applications in Japan and America [J]. Henan Science and Technology, 1986(4):26.

[26] LEWIS, M. BRANSCOMBE, Kai Wenting. Popularizing IT and revitalizing the American economy [J]. Systems Engineering and Electronics, 1983(10):35-41.

[27] Zang Yun-ping. Internet development in China and its characteristics[J]. China Information Herald, 2003(3):29-32.

[28]LANZOLLA, G. and ANDERSON, J. Digital Transformation[J]. Business Strategy Review, 2008, 19(2).

[29]ARK, BART VAN. The productivity paradox of the new digital economy[J]. International Productivity Monitor, 2016,(31):3-18.

[30] Chen Yunwei, Cheng Hua. Metacosmic economics: comparison with the real

economy [J/OL]. Research on financial issues: 1-21.

[31] Cai Yuezhou. Digital transformation contributes to the development of quality [N]. Wirtschaftstageszeitung, 20.11.2020.

[32] Li Xiaohua. The evolving trend of global manufacturing industry structure and China's survival strategy[J]. Financial Research 2021(1):31-42.

[33] MENG B. XIAO, H. YE, J. et al. Are global value chains really global? A new perspective based on measuring trade in value added [J].