

Research and Prospect of Digital Economy Development in Shandong Province

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Abstract. Digital economy refers to the economic model that takes digital technology as the core to drive the whole economic activity process and create benefits. In the future, all economic links may be driven by digital technology, digital technology will be the main driving force for world economic development, and digital economy will be the new engine for world economic growth. The great transformation of digital economy is a new opportunity for economic development. The development level of digital economy in Shandong province has entered the first echelon in China, but there are still some factors restricting its development. The digital economy has become the core force leading the scientific and technological revolution and industrial transformation, and human society is entering a new stage marked by digital productivity. Shandong province must correctly grasp the general trend of the development of digital economy, do a good job in planning and creating momentum and taking advantage of it, accelerate the construction of a strong digital province, make the digital economy become an important starting point to promote the conversion of old and new drives and an important supporting force of “lead the way”.

1. Introduction

Digital economy refers to a new economic model resulting from the deep integration of high and new technologies such as information technology and network technology with the real economy. It is a brand-new economic system in which all economic activities are digitized. In this economic system, digital technology is the driving force of all links. The essence of digital economy lies in informatization. With the rapid development of high and new technology represented by information technology, the competition in comprehensive national strength characterized by informatization and the development level of information industry is increasingly fierce. The far-reaching impact of informatization on economic development and social progress has attracted worldwide attention.

2. Digital economy theory

The definition of digital economy has been interpreted by many institutions from different perspectives. “The G20 digital economy development and cooperation initiative” points out from the general level that the digital economy refers to a series of economic activities, with the use of digital knowledge and information as the key factors of production, the use of modern information network as the important carrier, the effective use of information and communication technology is an important driving force for efficiency improvement and economic structure optimization[1]. China informatization 100 association point out that digital economy is divided into two parts: foundation part and integration part[2]. The foundation part refers to the information industry itself, including

electronic information, telecommunications operations, Internet and radio & television; the integration part is the increase of output and efficiency brought by the integration and penetration of information and communication technology to other industries, it can also promote the transformation and upgrading of traditional industries and promote the transformation and development of the whole society. Based on existing research, combining the actual situation of the digital economy, CCID consulting believes that the digital economy is the sum of a series of economic activities with digital technology as the important content, these activities not only include a series of new technologies, new products, new models and new business forms generated by digital elements, but also include the economic growth brought by the deep integration of digital elements and traditional industries. The core content of the digital economy in the "new era" will be based on "new drivers", which will drive the overall digital upgrading of industries and society[3].

Digital economy can be simply divided into basic digital economy, resource digital economy and industrial digital economy. Basic digital economy mainly refers to the part supporting the development of digital economy, which is embodied in the construction of digital information infrastructure, cutting-edge technologies in related fields, investment in disruptive technologies and technological output brought about by technology transfer and transformation. Resource digital economy mainly refers to the data level, including the aggregation and application of data resources; Industrial digital economy mainly refers to the integration of new generation information technology and traditional industries, including the first, second and third industries. It focuses on the changes in production and operation modes of traditional industries caused by high and new technologies and network technologies, as well as the convenient, efficient and fast digital services provided to meet the needs of residents in all aspects of life. From the relationship among the three, basic digital economy mainly refers to physical infrastructure and core technology, which is the carrier of digital technology realization and the foundation and core driving force of digital economy. Resource digital economy refers to the utilization of data resources and is also the main difference between digital economy and traditional economy. Big data is also the main line of development and upgrading of digital economy. Industrial digital economy focuses on various applications of digital technology in the fields of production and life.

3. Current situation of digital economy development in Shandong province

Shandong province has issued a series of policy documents, including "opinions on the implementation of major projects to promote the conversion of old and new drivers of growth", "digital Shandong implementation plan" etc., to actively promote the development of the province's digital economy and foster the growth of the "four new" economy, and remarkable achievements have been made. The 2017 China digital economy index (DEDI) report released by CCID consulting pointed out that digital economy development level of Shandong province ranked fourth in China, entered the first echelon. By the end of 2016, the Internet penetration rate in Shandong was 52.9 percent, ranking 13th in China. It is the province with the lowest Internet penetration rate in the eastern coastal areas, 21.1 percent lower than Guangdong, 12.7 percent lower than Zhejiang and 3.7 percent lower than Jiangsu. In 2017, the main business income of the information technology industry in our province was 1.5 trillion yuan, only accounting for about 10% of the above scale industries, there is a big gap compared with Guangdong and Jiangsu[4].

Big data has been applied more deeply in Shandong. Currently, Inspur group has built an e-government public service cloud platform for the Shandong provincial government, which has integrated and deployed 70 provincial organs and 500 business application systems, with a coverage rate of over 50%. In many cities in Shandong province, Internet plus government services enable enterprises and people to handle various administrative approvals and enjoy public services only once at most. As a result, the efficiency and service quality have been continuously improved.

4. Development restriction of digital economy in Shandong province

Although the digital economy development level of Shandong province ranks top in China, there is still a big gap compared with Guangdong, Jiangsu or other provinces, mainly because that the development of emerging productivity is still in its primary stage, the level of data resources development and utilization is low, core technologies and equipment are subject to the control of others, talents and investment & financing systems cannot meet the needs of the development of the digital economy.

Traditional enterprises lack the power and ability of digital transformation. Quite a few enterprises lack the understanding of industrial internet and intelligent manufacturing, let alone the transformation and upgrading of these advanced digital technologies. On the other hand, it lacks the guidance and support of the local digital economy platform. Platform is the basic unit of coordinating and allocating resources in the era of digital economy and the core of value creation and value convergence. The rapid development of digital economy in Guangdong, Zhejiang, Jiangsu and other provinces is largely due to the guidance and support of Tencent, Alibaba, Suning or other platform enterprises.

Current salary level of Shandong province is left far behind Guangzhou, Zhejiang and other places, which leads to a lack of attraction for high-end technical talent, serious lack of artificial intelligence talent and robot engineer, as an important bottleneck restricting the innovation and development of digital economy, high-end talents and inter-disciplinary talents are scarce.

5. Index system of digital economy evaluation in Shandong province

Considering the current situation of the digital economy in Shandong province, the relevant indicators are selected from four aspects: macro-economy, digital infrastructure, industrial digitalization and digital industrialization. The macro-economic level focuses on the macro background of the development of the digital economy. Indicators include: the added value of the primary industry, the added value of the industry, the added value of the tertiary industry, and the scale of information consumption. The level of digital infrastructure is based on digital technology and key information infrastructure, and reflects the basic capabilities supporting the development of digital economy from the development of networks, terminals and users. Indicators include: large data investment and financing, market scale of cloud computing services, number of Internet of Things terminal users, mobile Internet access traffic, fixed broadband household penetration rate, mobile broadband user penetration rate, fixed broadband user proportion of more than 200M, fixed broadband user proportion of more than 100M in rural areas, fixed asset investment, Internet investment and financing, and total import and export of electronic information industry. The level of digital industrialization is based on the scale of digital industry industrialization. Indicators include: industrial added value of new generation information technology, income from software business, income from big data products and services, and total amount of inventions in the field of information technology. The digital level of the industry measures the future digital upgrading of the industry. The indicators include: the integration development index of the two industries, the number of cloud enterprises, the retail sales of the network, the B2B revenue scale, the scale of online car service, the daily average demand volume of online video, the monthly active users of WeChat, the market scale of search engines, the volume of electronic payment business, "Internet plus" collaborative manufacturing, "Internet plus" smart energy, "Internet plus" inclusive finance, "Internet plus" efficient logistics.

6. Suggestions on the development of digital economy in Shandong province

First, further strengthen the construction of Shandong's information infrastructure. Broadband networks and mobile networks are the highways of the information age. The information highways should be wider and more unimpeded, provide resources equally to the public, and stimulate greater innovation. We should strengthen the construction of information infrastructure, constantly promote

the transformation of high and new technologies from the laboratory to the market, reasonably reduce the threshold and cost for consumers to use the information network, and actively participate in the formulation of relevant international standards to enhance the province's international voice in the field of information[5,6].

Second, create a sound business environment. We should further transform government functions, effectively reduce excessive administrative approval for market entities, eliminate unreasonable administrative fees, reduce administrative costs for market entities, and appropriately reduce taxes and fees for enterprises. At the same time, we should improve the ability of administrative management and service, and better stimulate the vitality and innovation ability of market subjects.

Third, establish and improve institutions and mechanisms suited to the digital economy. We should further improve laws and regulations, address the relative lag in legislation in some areas, and solve specific problems related to the vital interests of the people in the context of the development of the digital economy. In this regard, relevant departments need to pay attention to the far-reaching impact that digital economy may have on government governance, social forms, individual rights and interests, etc., actively carry out forward-looking research, constantly innovate systems and mechanisms, and coordinate the interests of all parties.

Fourth, create conditions for the in-depth integration of digital economy and real economy. It is necessary to strongly support the in-depth integration of the new generation of information technology with the real economy, encourage enterprises to use new technologies such as artificial intelligence and the internet of things to innovate business application models, so as to provide strong impetus for the development of the real economy and give better play to the role of the digital economy in promoting high-quality development.

Fifth, cultivate a vibrant digital economy industry. Including building a model of digital agriculture, promoting the upgrading of intelligent manufacturing, leading the development of intelligent service, fostering the momentum of digital industry, developing Smart Ocean industry, speeding up the construction of digital parks, etc.

Conflicts of Interests

The authors declare that there is no conflict of interests regarding the publication of this paper.

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