

Fostering and Catalyzing New Quality Productivity of Digital Economy in the Process of New Industrialization

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Abstract: The construction of digital China and the development of digital economy is the strategic choice of China. Today this change, originating from information technology, especially the rapid development and wide application of a new generation of information technology, has brought about a wide-ranging and deep socio-economic revolution, the digital economy as a new economic form came into being, and the digital transformation has become an inevitable choice for the development of the country and human society. Data factorization faces a series of difficulties and is an international challenge that everyone is still in the process of exploring. In addition to institutional barriers, data factorization faces many technical challenges. In addition, the issue of data ownership has not yet been effectively resolved, and the circulation and sharing of data is fraught with difficulties, as well as outstanding security, privacy protection and regulatory issues. These are a series of challenges now. It can be seen that data factorization is still in the early stage of exploration, there is still a long way to go, is a systematic project. Now that the country is starting to build the top-level design, the system should be built to do a good job of top-level design, but also need to leave enough space for exploration and innovation.

Keywords: Digital economy; New industrialization; Data resources; Digital productivity

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1. Introduction

Data resources have gradually become the fourth major factor of production after the three factors of production of "land, capital and labor", and with the advent of the era of credible data trading, data has risen to become the core asset of the society, and has become an economic resource that cannot be ignored in modern society. From the birth of the computer to the popularization of the Internet, from the interconnection of all people to the interconnection of everything, from artificial intelligence to the blockchain, human beings are reconstructing a new system of perceiving, disseminating, acquiring and utilizing information in the external world, reconstructing the infrastructure of division of labor and collaboration, means of production, tools of production and collaboration modes, and reducing the cost of management and supervision of information within the organization, as well as the cost of external transactions and collaboration, and innovating the collaboration modes. Enterprise boundaries are being redefined, hierarchical organizations are being dismantled, producers and sellers (prosumer) continue to emerge, the advent of the particulate society, the rapid rise of the platform economy, the human society has evolved from the industrial society of millions of collaborative production system to tens of millions, hundreds of millions of people's cooperation, which has also brought about the continuous deepening of the industrial division of labor.

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In fact, there is still no consensus on the definition of the term digital economy alone. There are still many people who translate the digital economy into the Internet platform economy, or even equate it directly with the virtual economy. In fact, the digital economy is a complex system involving multiple disciplines, fields and levels, and must be scrutinized in an all-round way from a multidisciplinary and cross-field perspective. At present, there are still a large number of open issues worthy of in-depth exploration and practice, such as the definition of the connotation and extension of the digital economy, the measurement method and statistical caliber of the digital economy, the structure of data ownership, and the mechanism of assessing the value of the identified and distributing the benefits, the institutional mechanism of the data circulation and trading, the cultivation and allocation of the market of data elements, the data security and privacy protection, the relevant digital legislation, the ethics of digital era, governance, the development of digital economy and digital regulation, and the development of the digital economy. Governance, the balance between digital economic development and digital regulation, the construction of digital economic infrastructure and ecology, including the digitization of new digital infrastructure and traditional physical infrastructure, the research and development and innovation of core key technologies for digital economic development, the impact of the digital economy on traditional disciplines such as economics, management, finance, social governance, and the support of traditional disciplines on the research and practice of the digital economy.

The driving force for the evolution of human society lies in the deepening of the division of labor and information exchange under uncertainty, the interaction of information to promote the division of labor and collaboration, and the division of labor and collaboration to enhance the ability of human beings to cope with uncertainty. From information exchange to division of labor and collaboration to elimination of uncertainties, this is the driving logic of the evolution of human society.

2. Digital Productivity Builds New Dynamics of Growth

From the viewpoint of efficiency, the “simulation of excellence” based on digital simulation makes industrial innovation activities iterate rapidly in cyberspace, prompts innovation activities to cross, reorganize and optimize in time and space, and significantly shortens the cycle of new technology products from research and development, small test, pilot test to mass production. From the perspective of the main body, the “simulation selection” based on digital simulation has promoted the generation of a large number of digital platforms, reduced the threshold and cost of innovation and entrepreneurship, and enabled the public entrepreneurs to rely on platforms, make full use of industrial resources to carry out innovative activities, and directly participate in the product conception, design, manufacturing, improvement and other aspects, so as to truly realize the real meaning of The real sense of mass innovation is truly realized. From the process point of view, the rapid development of data analysis technology promotes the reverse propagation of data linkage in the chain of “demand-data-function-creativity-product”, and the main body involved in the production process evolves from producers to producers-consumers.^[1] The main body involved in the production process has evolved from producers to producers and consumers, and the rise of personalized customization mode allows consumers to participate in the whole production process, and the voice and influence of consumers in the product process have been continuously improved, and the innovation process of integrating factors of production in the positive direction centered on producers in the past is transforming into the innovation process of integrating factors of production in the negative direction centered on consumers.

In the development of the economy of scope brought about by digital productivity, fundamental changes will occur in the way production is run, the mode of organization and management, and the way services are provided. First, the production mode is flexibilized. The development of digital productivity, so that the traditional mechanized mode of production is replaced by automated mode of production, automated

mode of production to further liberate human beings from heavy physical labor; rigid mode of production to flexible mode of production change, so that enterprises can be flexible and timely according to the market changes in a manufacturing system to produce a variety of products; so that the large-scale centralized mode of production into a personalized on-demand production On-demand production mode, breaking the contradiction between industrialization and personalization, to achieve the industrialized means and efficiency of manufacturing personalized products. Second, organization and management flexibility.

The development of digital productivity, the formation of ubiquitous, timely, accurate information interaction, significantly reduce information, evaluation, decision-making, supervision, default and other transaction costs, bringing profound changes in the form of business organizations, processes, mechanisms, subjects, and promote the emergence of a new zero-work mode, bringing a people-oriented organization and work: the traditional employment model from "enterprise - employee" transformed into "enterprise - employee". The traditional employment model is transformed from "enterprise-employee" to "platform-individual", replacing the traditional management mode with self-organization mode, breaking the top-down sectional structure of the enterprise, and liberating the productivity of individuals to the greatest extent possible; promoting the formation of flexible organization, responding to market demand and environmental changes quickly; promoting the rise of new zero-work mode, bringing a people-oriented organization and work style. Promote the formation of flexible organization to quickly respond to market demand and cope with environmental changes; promote the formation of borderless organization to build cross-industry, cross-field, cross-body industrial ecosystem. Third, the integration of service mode.^[2] The development of digital productivity has brought unprecedented cross-border integration, and the integration of information technology has profoundly changed the business model of the service industry, which has given rise to the take-away mode in the catering industry, the birth of Internet hospitals in the medical industry, and the development of e-commerce, which is a new industry that changes the way of life, under the background of the Internet, with the combination of retailing and logistics; the integration of the manufacturing industry and the service industry has broken the industrial boundaries, and the manufacturing enterprises have shifted their value chain from manufacturing-centered to service-centered. The integration of manufacturing and service industry breaks the industrial boundaries, manufacturing enterprises will change the value chain from manufacturing-centered to service-centered, and the service elements and service products occupy an increasingly important position in the input and output of the manufacturing industry.

3.The Kinetic Shift from "Economies of Scale" to "Economies of Scope"

Enterprise competition is changing from competition for resources such as factors, markets and technologies to data competition, and data has become the core driving factor for enterprises to occupy the high ground of industrial competition. From the perspective of data resources, when perception is ubiquitous and connection is ubiquitous, data will also be ubiquitous. All production equipment, sensing equipment, networking terminals, including the producers themselves are constantly generating data resources, which permeate the entire life cycle of product design, modeling, process, maintenance, etc., the production, operation, management, service and other aspects of the enterprise, as well as the entire value chain of suppliers, partners, customers, etc., and are becoming the cornerstone of the production and operation of the enterprise.

From the perspective of data management, digital transformation is gradually becoming a must for enterprises in the era of digital economy, and data management capability is the core capability in digital transformation. The data-driven competitive situation requires enterprises to elevate data to the same strategic position as accounting, finance, management and other functions, and will become the basic guideline for

enterprise operation in the future. From a data-driven perspective, enterprises collect, store, analyze, and mine data from the entire production process, product lifecycle, and supply chain through business systems dispersed in design, production, procurement, sales, operations, and finance departments, ensuring that all departments within the enterprise work together with the same data, so as to optimize the production, business, management, and decision-making processes through data value reengineering and improve the efficiency of production and operation. Optimize the production, business, management and decision-making processes through data value reengineering, and improve the production and operation efficiency of the enterprise.

The development of digital productivity, on the other hand, puts more emphasis on the coordination of multi-species products embedded in the long tail to satisfy customers' personalized needs under the condition of resource sharing, as well as the division of labor among enterprises and industries to bring about economic benefits, which is a kind of scope economy mode pursuing the weak incremental cost of multi-species products. The positive effects of technological progress are first and foremost, and the changes in social production brought about are field-wide. Under the joint action of digital resources, digital regulation and digital development, artificial intelligence can be used as a "meta-productivity" to promote the development of the "first productive forces" and become the engine of new quality productivity.^[3] Digital productivity is a new type of human ability to transform nature, which is triggering fundamental changes in the way human beings perceive new laws, discover new phenomena, and create new things, and will inevitably have a profound impact on industrial innovation, economic development, and social governance. The biggest change of digital productivity to human society is the continuous digitization of the physical world on which human beings rely for survival through technologies such as digital twins and the establishment of virtual mirrors in cyberspace, which is characterized by real-time efficiency, zero marginal cost, flexible architecture and other features and advantages, bringing great convenience to industrial innovation.^[4] It will fundamentally reshape the labor mode, production organization, social organization and social system of human society, forming a new type of digital and intelligent infrastructure, and then shaping a new form of human civilization, which will be an important manifestation of the growth of technology.

4. Data Elements, Digital Resources and the Transformation of Digital Productivity

As a matter of fact, the current research on the digital economy almost always uses the concepts and terminology of the industrial economy to interpret and describe the digital economy, defines the digital economy from the perspective of information technology, or describes the digital economy in terms of the attributes of traditional factors of production. However, if we look at the perspective of the development of the Internet, the opening of large-scale commercialization in the mid-1990s of the last century, and the large-scale commercialization and high-speed development for close to 30 years have widely extended to all aspects of human society and made in-depth applications, and in fact triggered a socio-economic revolution and profoundly changed human society.

In fact, the origin of the concept of digital economy is to describe the impact of the Internet on the mode of operation of all kinds of things in the world, especially business behavior. The current era of human-machine-object convergence ubiquitous computing has opened, and the Internet revolution has entered the second half represented by the industrial Internet, which focuses on organizations oriented to various industries and promotes profound changes on the supply side. The digital economy will be involved in all sectors of the social economy, becoming a new economic form with data resources as the key elements, modern information networks as the main carrier, the integration of information and communication technology applications, the digital transformation of all the elements as an important driving force to promote greater unity of equity and

efficiency.^[5]Undoubtedly,this socio-

economic revolution brought about by the new round of information technology represented by the Internet is disruptive, unprecedented in breadth, depth and speed, and in many ways far beyond the common sense and cognition we have formed in the industrial society, as well as far beyond our expectations for the future. In this sense, the digital economy will probably be the new disruptive economic form after the agricultural economy and industrial economy.

The current digital economy research and practice has faced many problems that cannot be explained and guided by industrial economic theories, such as data as a new type of factor, whose characteristics, value and significance have not yet formed a consensus. There is no consensus on a clear path and program to build a data factor market and allow data to participate in distribution as a factor of production. The status of data assets has not yet been established, the problem of data rights has not yet been solved, the sharing and circulation of data is full of obstacles, and the data security and privacy protection system is not sound, and these challenges also call for the construction of a data governance system. The rapid development of digital platforms has resulted in a dominant, winner-takes-all market pattern, which has brought about problems such as data siphoning, market monopolization, and tax erosion. There are still many inapplications to regulate them along the antitrust rules of the industrial economy era. The prosperity of the digital economy relies on globalized data circulation, sharing and trading, and the existing rules and systems of international governance are facing great challenges brought about by digital transformation. Although it is impossible to give a clear conclusion on this issue now, as far as my personal knowledge and understanding are concerned, it is still necessary to study the digital economy as a disruptive new economic form.

The digital economy involves many topics and requires experts from different perspectives to study and practice, with a view to building a panoramic view of the digital economy. Of course, this is not a quick fix, it takes time and space, theoretical research and practical exploration.

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