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Digital Economy and the Development of Rural Speciality Industries

-- Research on the Development of Rural Speciality Industries in the Context of Digital Economy

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Abstract

Integration of digital economic (technological) development is an inevitable choice for the growth of industries in China's urban and rural areas. Industrial prosperity in the countryside requires the development of speciality industries according to the reality of the countryside. The integration of characteristic industries and digital economy helps rural industries to flourish and accelerates the realisation of the goal of rural revitalisation. Due to different natural endowments, villages in the categories of agglomeration and upgrading, suburban integration, characteristic protection and relocation and annexation focus on the development of different characteristic industries. According to the actual situation of each type of villages, the development of characteristic industries and the digital transformation and upgrading of characteristic industries are the basic paths for the optimisation and development of rural industries in China. The development of special industries in different types of villages requires a sound digital foundation, the pooling of financial resources in various aspects, and the support and promotion of the construction of digital talents.

Keywords

Digital Economy; Special Industries; Digital Technology; Industrial Prosperity; Rural Revitalisation.

1. Introduction

With the rapid development of information technology, digital economy has become a new engine of global economic growth. In China, the digital economy has also shown a strong development trend, bringing unprecedented opportunities for the development of rural speciality industries. On the one hand, the development of digital economy breaks the traditional time and space limitations, so that the rural characteristics of the products can be more conveniently marketed and broaden the sales channels. For example, through e-commerce platforms, short video broadcasting and other means, many high-quality speciality products hidden in the mountains and unknown to the public have been able to open up sales channels, connecting rural resources and urban markets. On the other hand, digital technology has provided strong technical support for rural speciality industries, improving their productivity and greening. Big data technology can realise intelligent variety selection and enhance breeding efficiency and accuracy; technologies such as Internet of Things, drones and modern breeding and testing can reduce the use of pesticides and veterinary drugs, ensure the freshness and safety of agricultural products, and improve the quality of speciality agricultural products. However, rural speciality industries also face many challenges in the process of development. Influenced by factors such as remote geographical location and backward level

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of economic and social development, the countryside lacks the support of capital, talents, technology, information, market and brand in the development of speciality industries, and the required infrastructure is relatively weak. These problems constrain the strengthening and enlargement of characteristic industries in the countryside, making it difficult to transform the advantages of specific resource endowment into market advantages and profit returns. Therefore, how to give full play to the advantages of the digital economy and promote the development of rural speciality industries has become an urgent problem to be solved.

2. The Integration of Digital Economy and Rural Industry is the Basic Trend of Rural Industrial Prosperity

Scholars at home and abroad define the concept of digital economy differently. This paper argues that the digital economy is a form of economic development that takes digital knowledge and information as the core production factors and relies on modern information networks to achieve efficient operation of various economic activities. The digital industry consists of five types of industries: digital product manufacturing, digital services, digital technology application, digital drive and digital efficiency improvement, and the first four types of industries are the core industries of digital economy [1]. Digital economy to promote the revitalisation of rural industries (including agriculture, i.e. agriculture, forestry, animal husbandry and fisheries, as well as rural industry, commerce, tourism, culture and other industries), that is, the integration of the digital economy and rural industries, is based on data, digital technology, information networks, etc., and give play to the functional effects of the diffusion of digital technology, inclusive, etc., to promote the development of rural industries (especially various types of special industries), and then promote the overall prosperity of rural industry process. The digital economy empowers rural industries and promotes the development of rural industries (especially various characteristic industries).

The digital economy empowers rural industries and promotes and ensures the variety, abundant supply, improved quality and affordable prices of rural industrial products. At the same time, the digital economy makes the sales of various products smooth, production expectations stable, and the overall development of the rural industry environment is increasingly improved. The emergence of the digital economy has also given rise to new industries, business models and modes, expanding the rural industrial ecosystem [2].

Many scholars have studied the digital economy for industrial revitalisation in China, but mainly from the mechanism and path of the digital economy for rural industrial revitalisation [2,3,4], and the digital transformation of the agricultural industry [5], and the innovation of the mechanism for the integration and development of the digital economy and the rural industry [6], the 'dividend' and the 'gap' generated by the integration of the digital economy and rural industry [7] and other perspectives. Rarely has the issue of digital development of rural industries been explored from the perspective of the development of special industries in different types of villages. This paper is intended to do a preliminary exploration in this regard, that is, through the study of the development path of different rural characteristic industries (integrating the digital economy) in the context of the development of digital economy, to explore the characteristics of the rural industrial prosperity of the innovative approach.

3. Digital Development Path of Different Types of Rural Speciality Industries under the Background of Digital Economy

China is a vast country with different types of villages. Different types of villages can give priority to the development of their own resource endowed industries, forming a similar 'one village, one product' industrial development model. Of course, while there are differences in the

ISSN: 2688-9323

development of industries in different types of villages, there is also a tendency for integration and cross-fertilisation. That is to say, the industry developed by this type of village may also be developed in other villages. In this paper, for the expository aspect, a certain type of village only choose the practice of its own resource endowment and the most characteristic industry to discuss. Doing a good job and strengthening its own characteristic industries is the basic path for all types of village revitalisation.

As a matter of fact, China is also currently promoting rural revitalisation by classifying villages according to their characteristics. This means that China should implement the rural revitalisation plan in accordance with the development status, location conditions and resource endowment of different villages, and comply with the law of village development and the trend of evolution, and implement the rural revitalisation plan in accordance with the four categories of clustering and upgrading, integrating into towns and cities, protecting characteristics and relocating and withdrawing villages. At the same time, it is also necessary to promote the construction of digital villages in accordance with the four categories of villages, strengthen the digital development of rural characteristic industries, and promote the prosperity of agriculture and rural economy. The strategy is also a basic requirement of documents such as the Strategic Plan for Rural Revitalisation (2018-2022) and the Strategic Outline for Digital Village Development.

Taking into account the actual development of various types of villages in China, the most characteristic industries that can be prioritised or developed in each type of village and the corresponding promotion strategies are as follows.

3.1. Gathering and Upgrading Villages

Gathering and upgrading villages (see the 'Strategic Plan for Rural Revitalisation (2018-2022)' for the specific definition, and the same for the other three types of villages below) are generally larger villages, which are the main form of villages in China at present, and are generally located in the plains, mountainous river valleys, and flat coastal areas, and are the main production areas of grains, vegetables, and seafood.

This type of villages should focus on the development of characteristic industries integrated with the digital economy, i.e., attention should be paid to guiding the villages to deepen the application of network information technology in a comprehensive manner, and to cultivate the traditional advantageous industries and new forms of business in the countryside. The development of such characteristic industries in villages (high-quality and high-efficiency, regional characteristic breeding industries; characteristic park industries; digital technology industries that effectively guarantee product safety and price control, etc.) is mainly in the following three states: First, as the main production areas of major crops (grain, oilseeds, cotton, etc.), efforts are made to promote the digitalisation of seed cultivation and breeding processes. Second, in various rural industrial parks, to promote the digital development of the park's characteristics of agricultural product processing, where the agricultural products are agricultural products in a broad sense, including food, medicinal herbs, livestock products, aquatic products and so on. Thirdly, it is the main place to guarantee the supply of people's daily products (mainly table products), and in order to ensure the quality and safety of products, the whole process of monitoring the industrial chain of special agricultural products is carried out through digital technology (relying on big data).

To promote the integration of this type of rural characteristic industry into the digital development, specifically, it is to do the following aspects.

3.1.1. Promoting the Digital Transformation of Agriculture

According to the Outline of the Digital Rural Development Strategy (2019), China's vast countryside, especially in the gathering and enhancing category of villages, as the main crop production area, should accelerate the promotion of a new generation of information

ISSN: 2688-9323

technology and related products, such as cloud computing, big data, the Internet of Things, artificial intelligence, etc. and the deep integration of the farming industry, and strive to build a digital, intelligent and branded agriculture.

To this end, efforts should be made to promote the high-quality development of the breeding industry in the main crop production areas by making efforts in the areas of intelligent agricultural equipment, agricultural science and technology information services, the use of agricultural digital technology and the construction of a smart green countryside.

(1) Promote the integration of modernised rural equipment and information technology. Research and develop intelligent agricultural equipment and promote its use to improve the level of agricultural equipment intelligence. Actively develop the industrial Internet, boost the organic integration of new information technology with agricultural equipment, agricultural operation services and agricultural management, and promote the automation, standardisation and intelligence of the agricultural production process.

(2) Optimise agricultural science and technology information services. Provide comprehensive services for agricultural science and technology, create an online trading platform for agricultural technology, and promote the combination of online trading and offline transformation. Revise and improve the normative system of online guidance and online training for various types of agricultural technology experts. Improve intermediary services for new rural technologies, and build bridges for information communication between technology providers and agricultural operators.

(3) Promote the introduction of digital technology in the agricultural breeding process. Use digital technology to analyse breeding information and monitor the quality and progress of breeding; analyse and calculate agricultural data collected by sensors, and organise planting and maintenance scientifically and effectively; monitor crop pests and diseases in real time, and issue early warnings and give certain diagnostic information, so as to facilitate precise treatment by the agricultural sector.

(4) Construction of intelligent green countryside. According to the requirements of green and high-quality development of modern industries, in the main crop production areas, efforts should be gathered to promote green agricultural production methods, track the use of agricultural inputs through the electronic traceability system, and reduce the use of pesticides and chemical fertilisers. At the same time, the IoT platform is used to monitor the moisture condition of the land as well as the growth of crops sown with organic fertiliser in facility agriculture parks.

3.1.2. Developing Large-scale Digital Industrial Parks

General traditional accumulation and enhancement of class villages and the surrounding area, the distribution of different categories of industrial parks, both manufacturing industrial parks (high-tech development zones, industrial transfer parks, etc.), but also at the same time the characteristics of agricultural industrial parks. It is necessary to focus on the digital development of characteristic industries in industrial parks, i.e. to promote the digital transformation of multi-processing manufacturing industries (described in detail below); at the same time, it is especially important to promote the digital development process of the integration of planting, raising and processing in characteristic agricultural industrial parks. Focusing on using the advantages of enterprise aggregation in the park, the park should make use of digital technology to link the production, subsequent processing and external marketing of agricultural products into a dynamically connected industrial chain, and share relevant information and technology. That is to say, to improve the industrial chain of 'production of special agricultural products - agricultural product processing - food (sales)' and other crops in the main production area.

ISSN: 2688-9323

3.1.3. Digital Technology Makes Safety and Price Controllable.

Digital technology is used to realise the safety and price control of products of special industries in all links of the rural industrial chain. The safety of products as well as price stability are the basic needs for the digital development of various types of village speciality industries. However, such needs are stronger and easier to realise in villages with a more sound industrial chain and a large-scale development of industries (products) (due to the large scale and more and more sound regulatory networks). Firstly, digital technology can overcome information asymmetry in production, operation and consumption, and effectively control the quality and safety of products and services in the main crop production areas. At present, many websites and platforms using digital technology have been set up with functions such as product user evaluation, reputation search, and responsibility tracing. To continue to promote various types of e-commerce platforms and the agricultural industry in all aspects of the technical docking, effective integration of information, and promote the realisation of product production, storage and transportation and quality and safety supervision and other aspects of the traceability and query, the whole process of tracking and solving the problem of agricultural product safety. Secondly, digital technology can control the scale of output, balance the price of special agricultural products (especially the price of products in the main production areas of large agricultural products in the villages of continuous aggregation and upgrading), stabilise the incentive of farmers to plant and breed, and ensure that the supply of staple foods and other products is continuously guaranteed. The promotion and application of big data, e-commerce and other digital technologies and the platform economy have made the supply and demand sides of agricultural products and related products or services more transparent in the display of supply and demand information, and more accurate in the prediction of the output and demand for agricultural products, thus reducing the potential for large fluctuations in agricultural products. The development of digital technology and intelligent logistics has also popularised the direct supply of products, reducing excessive intermediate links in the supply chain, stabilising consumer demand, facilitating the control of the scale of production by producers, and reducing the disorderly price fluctuations caused by asymmetric information.

3.2. Suburban Integration Villages

Suburban integration villages mainly refer to villages in the suburbs of cities and around county towns, with urban-rural interface and transition, and both urban (city) and rural (village) characteristics. It is important to focus on the use of urban spillover resources to drive the development of the countryside, and at the same time to further satisfy the diversified consumption needs of neighbouring cities with the high-quality development of the countryside. In view of the trend of integrating the development of digital economy, this type of villages especially need to pay attention to the use of digital technology to promote industrial development and meet the consumption needs of urban and rural residents. According to the location of the countryside and the development trend of the industry, such villages should give priority to promoting the digital development of three types of characteristic industries: firstly, promoting the digital development of new forms of agriculture, such as suburban facility agriculture, sightseeing agriculture, and recreational venues (agro-entertainment); and secondly, digitally transforming urban-rural connecting circulation service outlets, such as logistic transit centres (stations). The third is the digital development of the manufacturing industry in the near suburbs.

3.2.1. Actively Developing New Rural Businesses

Make use of the city's information and intellectual overflow advantages to promote the deep integration of the Internet and speciality agriculture, and promote the creation and prosperity of new types of agricultural business - creative, adoption, sightseeing and urban agriculture, etc.; at the same time, promote the development of new industries (leisure and recreation,

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health care and creative At the same time, it will promote the development of new industries (leisure and recreation, health care and creative lodging, etc.) and the standardised and orderly growth of the rural sharing economy.

3.2.2. Innovating the Rural Distribution Service System

Take advantage of the proximity to the city and the digital logistics platform to expand the function of the logistics node location. Co-operate with major logistics companies to set up regional logistics transit stations and carry out logistics docking services with remote villages. For local villages with abundant fresh produce, further innovation in circulation services should be carried out, implementing the 'Internet +' agricultural products out of the village and into the city plan (green logistics plan), and strengthening the digital supervision of the whole industrial chain of agricultural products from production to warehousing and delivery.

3.2.3. Promoting the Digitalisation of Rural Speciality Manufacturing Industries

For villages that connect urban and rural areas and have a good manufacturing base, it is necessary to focus on the digital transformation of the industry and continuously adjust the structure of manufacturing products according to the actual development of the industry, so as to promote the upgrading of the industry. For example, Beijiao Town, Shunde District, Foshan City, Guangdong Province, in 2022, the gross domestic product has exceeded 100 billion yuan. The town's villages have paid great attention to the development of the manufacturing industry during the course of reform and opening up. The villages have taken advantage of the 'city with village' advantage, not only the rational use of rural resources, vitality, but also the use of the city's industrial drive, scientific and technological services. Early in the rise of the home appliance industry, Beijiao enterprises have taken advantage of the local low land rent, from Guangzhou, Foshan city state-owned units to invite Saturday engineers, and continue to expand their business, access to early development opportunities.

Beijiao town villages with the changes in market demand, but also focus on constantly adjusting the industrial structure. That is, from the beginning of agriculture, to agricultural machinery factory and other initial machinery and equipment industry, to 'small' hardware, plastics industry, and then aiming at the shortage of economy, to develop air conditioning, washing machines and other large electric appliances industry, always at the forefront of the industrial restructuring. In recent years, Beijiao has begun to vigorously develop the digital economy, robotics industry, industrial design industry, etc., also hitting the key moment of economic adjustment.

3.2.4. Utilising Location Advantages

Focusing on the advantages of location, the use of relatively developed digital technology and products to strongly promote the coordinated development of primary, secondary and tertiary industries. Similar to Foshan Beijiao and other suburban villages, while adhering to the manufacturing industry as the leader, but also emphasise not only the manufacturing industry, that is, focusing on promoting the coordinated development of 'agriculture, industry and business', preserving the farming tradition, strengthening the supporting service industry, and realising the advantages of livability, workability, culture and tourism. Only in this way can we give better play to the advantages of urban and rural integration, retain talents and retain the headquarters economy [8].

3.3. Characteristic Protection Class Villages

Characteristic protection class villages mainly refer to those villages with rich natural as well as historical and cultural resources, such as historical and cultural villages, ancient traditional villages, ethnic minority characteristic villages, characteristic landscape tourism villages and so on. These villages should do a good job in the protection of traditional resources and the coordinated development of special industries. These villages are often located in mountainous

ISSN: 2688-9323

areas with inconvenient traffic but rich in special agricultural resources, so they can develop industries combined with special resources.

This type of villages according to the actual countryside and the development of the digital economy, we should pay attention to 'guide villages to explore unique resources, building the Internet characteristics of the village.' Two types of special industries should be promoted in practice. The first is cultural tourism villages, developing special tourism industries and promoting the construction of digital projects for cultural preservation. The second is to develop (using digital technology) characteristic regional industries (products) based on characteristic resources.

Specifically, characteristic conservation villages under the digital economy can develop local characteristic industries in the following ways.

3.3.1. Prosperous Development of Village Network Culture

Combine with the cultural celebrities, cultural monuments, village inspirational or good stories and legends of the village and the hometown, and make use of the digital Internet platform to promote the local culture. The digital display of outstanding farming cultural resources in villages can be promoted through the construction of 'digitalisation of cultural relics resources' and 'agricultural cultural heritage network exhibitions'.

3.3.2. Development of E-commerce + Specialised Niche Industries

The combination of e-commerce platforms and agriculture promotes the improvement of the quality of agricultural production from the demand side, and realises precise marketing and personalised customisation. E-commerce platforms have a large number of customers with different preferences, so that those 'niche' and 'out-of-the-way' products also have sufficient market space. Even products that are located in remote areas, with unique varieties and scarce production (e.g., certain speciality agricultural products from speciality protected villages) can be successfully sold [9]. Many e-commerce companies can also take the local inspirational celebrities or local entrepreneurial success, rural netizens endorsement of the way to carry out live video marketing, some characteristics of the small brand through the live webcast, continue to attract 'fans' to buy, expanding the consumer base.

3.3.3. Development of Speciality Agriculture + Diversified Industries

Developing speciality agriculture (using the region's unique natural resources) and diversified industries. The digital economy expands the rural industrial ecosystem, helping to resolve the industrial risks latent in the long-term single-industry development of the countryside. Villages (especially those with special resources) need to realise the integrated development of primary, secondary and tertiary industries, so as to break the single linear chain of 'agriculture + processing of agricultural products and food sales' and form a more complex industrial chain, for example, to promote the formation of agriculture '+ local pharmaceutical raw materials and their processing', or '+ local medicine processing', or '+ local medicine processing', or '+ local medicine processing', or '+ local medicine processing'. ', or '+ biological breeding and related education and scientific research', or '+ speciality tourism and rural speciality catering' and other diversified industrial chain, and then form a network-type industrial development path, which can effectively avoid the risk of single development path of industry (of course, this kind of village development). This can effectively avoid the risk of single industry development path (of course, this kind of villages should pay attention to the full protection and reasonable use of the special treasured resources for the development of special industries). The diversified development of rural industries and the better growth prospects in the future will also lead to the influx of more urban capital and talents, thus forming an internal driving force for the development of rural industries and promoting the revitalisation of rural industries.

ISSN: 2688-9323

3.4. Relocation and Annexation of Villages

Relocated and annexed villages usually refer to those villages with poor living conditions, fragile ecological environment, frequently affected by natural disasters or needing to cooperate with the construction of major projects, as well as those with serious population loss. From the perspective of integrating the development of digital economy, these newly merged villages should develop special industries according to the characteristics of the above three types of villages. Based on the fact that the environment of these villages (including the original villages and the new villages formed locally) is mostly an ecological protection zone, most of the villages should develop their own special industries according to the characteristics of the protected villages. For villages formed by out-migration, according to the actual situation of the out-migration area, combined with the development of the digital economy, the development of digital agriculture, processing industry, special tourism, farming, e-commerce logistics and other industries with the actual characteristics of the village.

The industrial development of relocated and annexed villages needs to focus on ecological protection and make up for the short board of digital construction. The government of the relocation area should pay attention to the original village (the original village of the annexation category) to carry out green digital construction and promote the protection of green fields (except for large national projects, such as the construction of reservoirs and other needs for off-site relocation and national unified planning and management), and at the same time pay attention to guiding and promoting the new villages (including the cooperation with the government of the relocation area) to improve the network facilities and information services, so as to avoid the formation of the new 'digital divide'. digital divide'.

3.4.1. Upgrading the Level of Information Technology for Rural Ecological Protection

For local relocated and merged villages (e.g. moving from the mountain to the settlement under the mountain, merging villages with serious population loss, etc.), a video monitoring system can be set up through county co-ordination to detect the original ecological environment zones of the villages (ecosystem fragile zones and sensitive zones) prior to the relocation and merger. For newly merged villages, it is also necessary to establish rural habitat monitoring platforms, strengthen the monitoring and protection of water quality of rural drinking water sources, and comprehensively monitor rural pollutants and pollution sources. The public should be guided to actively participate in the supervision of the rural environmental network and jointly maintain a clean ecological environment. Building green industries that can be dynamically supervised in real time (through digital monitoring systems) and promoting the implementation of green and beautiful countryside projects.

New villages relocated from one place to another should be integrated into the unified planning of villages in the place of relocation. The government of the place of relocation and the government of the place of relocation should work closely together (especially at the initial stage of relocation) to solve the problems of industrial development, work and life, and environmental improvement of villages in the new villages of migrants, and to promote the digitalisation of new villages in accordance with the actual situation in the place of relocation. The government of the place of relocation should also focus on digital environmental management of the original villages, or promote the inclusion of major projects in unified planning, and promote digital environmental monitoring.

3.4.2. Guiding the Improvement of Network Facilities and Information Services

Guiding relocated and annexed villages to continuously improve network facilities and information services, improving the system of combining specialised investment in network infrastructure with diversified investment by social capital (investment and financing issues will be discussed in detail below), providing good information infrastructure services for newly relocated and annexed villages, improving various digital information platforms, and attracting

ISSN: 2688-9323

agricultural technology companies to provide diversified digital products and marketing and promotional services for the development of rural industries.

4. Obstacles to the Development of Rural Speciality Industries in the Context of Digital Economy

The digital construction of different types of village characteristic industries, although currently facing different problems, also face common difficulties, namely, a weak digital foundation; insufficient financial support; lack of relevant talent support; the small and scattered scale of agricultural business inhibits the promotion and use of information technology, and so on. This paper focuses on exploring the digital development problems of various types of village characteristic industries and the corresponding countermeasures from the common problems (of course, the individualised safeguard countermeasures for various types of village characteristic industries are also slightly discussed in the following).

4.1. Agging Development of Digital Infrastructure

Digital infrastructure conditions include the use of basic telecommunication and agricultural digital technology, and its lagging development is mainly reflected in the following aspects.

4.1.1. Weak Infrastructures

Rural digital infrastructure is still relatively weak. Rural Internet, especially 5G penetration is not enough; the products of the digital economy are complicated to use, and the publicity is not enough, making the convenience of smart services insufficient, which also leads to limited choices for rural users.

4.1.2. Insufficient Technical Support

Agricultural digital technology has shortcomings and insufficient technical support capacity. At present, the basic originality of domestic agricultural digital technology is insufficient, and the application rate of intelligent, informatised and large-scale machinery and equipment in the villages (especially villages in the category of gathering and lifting in the main food-producing areas) is not high. There is a large gap between the use of sensors, artificial intelligence, and robots related to the agricultural industry and developed countries; the number of independently developed agricultural sensors in China is less than 10% [10], and the stability is poor, and most of the demand for high-end intelligent agricultural machinery and equipment in the rural industry relies on imports to fill the gap. The depth and breadth of the integration of digital technology and rural characteristic industries need to be expanded[11] .

4.2. Lack of Financial Resources

Funding gap is one of the most basic problems of digital development and digital transformation of rural industries. The scattered, weak and small rural characteristic industries, as well as the use of industrial digital technology requires a large amount of capital and a long recovery cycle, etc., all of which determines that it is difficult for the village characteristic industries to quickly absorb more social capital into. New industrial financing methods such as digital finance cannot make up for the short-term gap in industrial financing due to the insufficient construction of rural credit environment. Relying only on financial funding obviously can't solve the problem of financial constraints in the development of village speciality industries and their digital technological transformation. Therefore, the effective injection of diversified funds is needed.

4.3. Rural Digital Technology Talent Shortage

Due to the increase in the number of migrant workers, the resident population in most of China's villages tends to be the elderly and children. The overall ability of these people left

ISSN: 2688-9323

behind in the countryside to master new technologies is weak, and there is a lack of talent to support the digital development of rural industries. Although there are some digital technology talents who return to their hometowns to start their own businesses and work as well as serve in the countryside, there is undoubtedly a huge gap compared to the demand for industrial development. At present, governments around the world encourage digital talents to go to the countryside, but the supporting incentive system has yet to be perfected. The low-education and aging labour force structure also reduces the role of digital technology in the rural industry space. Currently engaged in agricultural products e-commerce group, the majority of intermediate education level, junior high school accounted for 50 per cent, high school accounted for 32.5 per cent, the university only accounted for 16.5 per cent. It is expected that by 2025, China's rural e-commerce will face a talent gap of 3.5 million [12]. And by the end of May 2020, the number of registered farmers' cooperatives nationwide reached 2,225,000, but only 2,473 cooperatives are engaged in online sales business, accounting for only 1/1,000.This indicates that the rural e-commerce talent gap and lack of capacity may be an important reason for restricting the online sales channels and scale of agricultural products.

It is true that, as shown above, the low educational level of the population, coupled with the generally older age of the current labour force left behind in the countryside, such a rural labour force structure largely restricts the space for digital technology to play a role in agricultural production and operation (including farming, processing, logistics, transportation and sales, etc.).

4.4. Constraints to the Effective Diffusion of the Use of Digital Technologies

At present, low intensification (based on a large number of low-intensification, i.e., small-scale traditional breeding industries, which also leads to serious homogenisation of rural industries) is still the normal mode of development of various types of rural characteristic industries. The uncertainty of urban income and other factors have strengthened the sense of 'staying on the land (not withdrawing or transferring) and avoiding risks' of rural migrant workers in their hometowns, which has severely constrained the development of large-scale and intensive rural land management. In China, there are 220-230 million farming households, and 80% of the arable land is operated by farming households with less than 50 mu [13]. Therefore, the degree of large-scale use of land and intensive management is low, which leads to restrictions on the adoption of new digital technologies in agriculture, which can not effectively improve the scale of output and can not fully demonstrate the economy of inputs.

5. Solving the Problem of Guarantee System for the Development of Rural Speciality Industries in the Digital Economy

To stimulate the endogenous momentum of rural revitalisation and promote the digital development of different types of rural characteristic industries, it is necessary to provide policy support in terms of network communication infrastructure, financial credit, talent training, etc., and stimulate the participation of social forces to promote the digital development of modern agriculture-related industries.

5.1. Improve Digital Infrastructure

5.1.1. Upgrade Rural Network Facilities

Accelerate the construction and upgrading of broadband, mobile base stations, and digital TV networks; research and develop digital technology products (including all kinds of application software, digital audio and video products, and information terminals, etc.) suitable for rural characteristics, and focus on publicity and promotion; comprehensively promote the digital and intelligent transformation of all kinds of rural infrastructures, i.e., widely applying digital

ISSN: 2688-9323

technology to transport, power grids, water conservancy, logistics, and production and processing.

5.1.2. Focus on the Construction of Digital Agricultural Information Resources

Especially for villages in the agglomeration and promotion category, it is necessary to improve the remote sensing supervision platform for rural natural resources, and implement dynamic monitoring of permanent basic farmland; promote the integration and shared use of data for the whole industrial chain of agricultural products with special characteristics in each village with the county as the basic unit, and so on.

5.1.3. Promote the Equalisation of Urban and Rural Public Digital Services

Vigorously promote the digitisation and informatisation services of government affairs, education, medical care and social security (which are also the basic conditions for guaranteeing the development of rural industries) in order to narrow the gap between urban and rural areas; and at the same time focus on improving the quality of agricultural information services. In the area of government services, the implementation of the 'Internet + government services' model allows for the handling of government affairs through online platforms, which is convenient and can improve the efficiency and level of service of government services; in the area of education, educational institutions at all levels are promoting the informatisation of education, and online education and digital teaching materials should be further promoted; in the area of healthcare and social security, digitalisation and informatisation of services will help to narrow the gap between urban and rural areas; at the same time, attention should be paid to improving the quality of agricultural information services. In the fields of healthcare and social security, digitalisation and informatisation applications have become an important means of improving healthcare and security services, such as electronic health records and electronic social security cards for healthcare insurance, which provide convenient and barrier-free services for the general public. Digitalisation and informatisation in the medical and social security fields should continue to be pushed forward in depth. In addition, focusing on improving the quality of information services related to agriculture is also one of the key factors in narrowing the gap between urban and rural areas, especially in the current wave of development of agricultural informatisation, through the popularisation of advanced information technology related to agriculture and improving the quality and penetration of information services, not only can more farmers be benefited, but also lay a good foundation for the upgrading and modernisation of the agricultural industry. In conclusion, focusing on the provision and development of digitalisation and information technology services is an important measure to narrow the gap between urban and rural areas and to promote social and economic development. It also creates more favourable conditions for agricultural transformation and industrial integration and development.

In addition, it should also focus on the digital and intelligent transformation and construction of agricultural machinery, accelerate the promotion and application of agricultural digital technology, etc. (as described in the previous aggregation to enhance the digital development of the characteristic industries of the class of villages), so as to narrow the gap between the intelligent digital products in the countryside and the villages of the developed countries in the West.

5.2. Accumulate Multi-party Financial Support

Attaching importance to regulation and support, and giving full play to the advantages of digital financial services for agriculture. That is, on the one hand, to give full play to the advantages of digital finance (including digital inclusive finance) in identifying financing needs, lowering financing costs, providing services for small and micro-credit, etc., on the basis of effective regulation (introduction of basic rules and requirements for financial services such as small deposits and loans, payment and settlement, and insurance; and cracking down on Internet

ISSN: 2688-9323

financial fraud, etc.), so as to provide small-scale financial support for various types of rural entities engaged in agricultural characteristic business. On the other hand, it is necessary to create a better policy environment for digital finance to play a role in the field of 'three rural areas'. For example, it should actively play the guiding role of financial funds and government industrial funds to guide digital finance to provide financing for rural industries in various ways. Expand investment and financing channels. Explore PPP, industry chain finance and other financing models; promote social capital to create a market-oriented operation of the rural digital economy special development fund; promote financial institutions to innovate financial products and services, and promote the digital transformation of rural characteristic industries. Multiple channels of funding to increase investment in the core industries of the rural digital economy can further stimulate the vitality of the development of the rural digital economy.

5.3. Strengthen the Cultivation of Digital Literacy and Skills Development, and Build a Digital Talent System for Rural Industrial Development.

The Fourteenth Five-Year Plan for the Development of the Digital Economy (2021) proposes to implement a national digital literacy and skills upgrading programme, support the inclusion of talents in the field of the digital economy in various talent programmes, and actively explore efficient and flexible policies on the introduction, cultivation, evaluation and incentives for talents. The Overall Layout Plan for the Construction of Digital China (2023), stresses the need to strengthen talent support, coordinate the planning of disciplines and specialised points in the digital field, and cultivate talents with innovation, application and compounding abilities. At the same time, a digital literacy and skills development cultivation system covering the entire population and integrating urban and rural areas is being established to enhance the public's digital thinking, digital cognition and digital skills.

The promotion of rural digital technology talents should be guided by the '14th Five-Year Plan for the Development of the Digital Economy', the 'Overall Layout Plan for the Construction of Digital China', and the 'Strategic Outline for the Development of Digital Rural Areas', etc., and a sustainable and dynamic development mechanism for digital science and technology talents to serve the countryside should be built in terms of nurturing, attracting and employing talents.

5.3.1. Improve the Multi-dimensional System of Training, Introducing and Using Talents

Various colleges and universities, especially vocational colleges and universities, should improve the modern apprenticeship and order-based cultivation model to promote the growth of digital science and technology talents. Establish a flexible talent introduction mechanism to encourage digital technology talents from universities and research institutes to go to the countryside to provide diversified full-time and part-time services to popularise digital agricultural knowledge. Make full use of the resources of the various types of village first secretaries, college student village officials, science and technology specialists, volunteers and other resources currently serving the countryside to promote the digital technology and industrial digitisation of the countryside.

5.3.2. Cultivating New Types of Professional Farmers

Incorporate agricultural digital technology into the basic literacy education of farmers, and vigorously cultivate new types of professional farmers. Continuously carry out the work of supporting the wisdom and aspirations of residents of all types of villages (especially villages with a concentration of poor people such as those in the demolition category), and carry out education on the popularisation of digital technology and internet knowledge. Improve the online training programme for new professional farmers in digital technology. Agricultural technology and platform-type enterprises should focus on the training of rural e-commerce and other applied knowledge, i.e., they should provide diversified live e-commerce training services

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for villagers employed in the countryside, especially for special resource villages to display and spread the stories of rural beauty, rural specialities and rural beauty to more people and more places through handheld mobile phones and other devices. In information technology training, attention should be paid to the popularisation and education of digital technology and network knowledge of special left-behind groups, i.e., the elderly, the disabled, and children, so as to enhance their ability to use digital technology, and to improve their awareness of and skills in network security protection.

5.4. Promote the Large-scale Operation and Digital Development of Rural Industries

Improve the market system of land transfer in villages with different characteristics, explore the establishment of a comprehensive service platform for land transfer in which villages, towns and counties are closely linked, and promote the orderly transfer of land in villages. In particular, the villagers who have been transferred out of the land (this mainly refers to the transfer of a certain period of contractual management rights) should be able to improve the digital tracking service, so that they can go to the city to work and return to their hometowns to develop both land transfer income or to obtain effective employment support and so on. Through the improvement of the system, to promote the rural areas, especially the industrial agglomeration area of the appropriate scale of cultivation, etc., to enhance China's 'put the rice bowl firmly in their own hands' of the bottom and confidence; at the same time, it will also be better to introduce digital technology, to promote the digital transformation of the rural industry.

Further strengthen the cultivation of new agricultural management and service main bodies and policy support for digital development, especially family farms, farmers' cooperatives, agricultural social service organisations, etc., should increase the policy tilt and assistance in agricultural digital machinery, digital information services, digital technology, etc., to play its leading role in promoting the moderate-scale operation of agriculture, and promote the development of small farmers.

The digital development of rural characteristic industries, in addition to the supporting support in digital foundation, funds, talents, etc., should also accelerate the pace of digital transformation in rural governance and other aspects, so that rural development is not only the characteristic development of industrial digitalisation, but also the all-round digital development of the countryside, so as to promote the overall modernisation of socialist modernisation of the countryside, and to help China's all-round modernisation to achieve its goals.

6. Conclusion

The integration of the digital economy into rural industrial development is the basis for the current prosperity of China's countryside. Various types of villages in the development of resource endowed characteristic industries at the same time should pay attention to the digital access and transformation, in order to further highlight the individuality and modernisation of rural industries, and with the help of digital technology to promote and be known by the public. The digital development of rural characteristic industries needs a strong guarantee system to solve the problems of weak digital foundation, lack of agricultural input funds, few digital talents and the digital quality of rural residents needs to be improved, and the scale of industrial operation is too small, etc. The digital development of rural characteristic industries can not only promote the development of rural characteristic industries, but also promote the development of rural characteristic industries. The digital development of rural characteristic industries can not only promote industrial prosperity, but also lead to the overall revitalisation

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of the countryside, which is the foundation work that must be paid attention to for the healthy growth of all kinds of villages in China.

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