



HAL
open science

Research on Agricultural Development Based on “Internet +”

Wenjie Feng, Lei Wang, Jia Zhao, Huaijun Ruan

► **To cite this version:**

Wenjie Feng, Lei Wang, Jia Zhao, Huaijun Ruan. Research on Agricultural Development Based on “Internet +”. 9th International Conference on Computer and Computing Technologies in Agriculture (CCTA), Sep 2015, Beijing, China. pp.563-569, 10.1007/978-3-319-48354-2_58 . hal-01614224

HAL Id: hal-01614224

<https://inria.hal.science/hal-01614224>

Submitted on 10 Oct 2017

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License

Research on Agricultural Development Based on "Internet +"

Wenjie Feng^{1,a}, Lei Wang^{1,b}, Jia Zhao^{1,c}, Huaijun Ruan^{1,d,*}

¹Institute of Information Technology, Shandong Academy of Agricultural Sciences, Jinan, 250100, P.R. China

^afengwjcn@qq.com, ^b375901677@qq.com, ^czhaojia9821@qq.com, ^drhj64@163.com, * corresponding author

Abstract. Agricultural modernization is an important way to construct modern agriculture. The development of intelligent terminal, mobile internet, communication technology, internet of things is being applied to agricultural production. It will greatly improve the level and degree of agricultural informatization, promote agricultural informatization development, improve agricultural production efficiency and improve agricultural production efficiency and promote the development of agricultural information technology and new technology.

Keywords: internet +, internet of things, agricultural information

1 Introduction

"Internet +" is to use the Internet thinking, Internet technology to promote the development of various industries and the transformation and upgrading, regardless of which kind of traditional industries, there is the opportunity to "Internet +", in the process, the core is the internet. China's agricultural development is lagging behind the industry, the government has introduced many documents to promote agricultural reform, mobile Internet communication technology in rural applications is also becoming more and more extensive, agricultural information is also changing the whole process of agricultural industry, and promote the optimization and upgrading of the industrial chain.

2 The internet + to provide a new platform

"Internet +" is to use the Internet thinking, Internet technology to promote the development of various industries and the transformation and upgrading, regardless of which kind of traditional industries, there is the opportunity to "Internet +", in the process, the core is the internet. China's agricultural development is lagging behind the industry, the government has introduced many documents to promote agricultural reform, mobile Internet communication technology in rural applications is also becoming more and more extensive, agricultural information is also changing the

whole process of agricultural industry, and promote the optimization and upgrading of the industrial chain.

Internet industry is the symbol of the Internet technology, business model, organizational approach to become the standard configuration of various industries. Three key technologies: ubiquitous terminal applications, an unprecedented strong background cloud computing capabilities, and continuously upgrade the broadband network constitutes the basis of the industry internet. The core competitive advantage of the relevant enterprise is the lower cost of the sensor, data storage and faster data analysis capabilities, the intelligent machine, big data analysis and other fields have accumulated and in-depth study of the enterprise will get a good opportunity for development.

China's broadband construction has made great progress in 2013, the State Council issued the "broadband China" strategy and implementation plan, proposed broadband network to become the new era of China's economic and social development of strategic public infrastructure, accelerate the rapid and healthy development of broadband infrastructure, and increase the speed of access to rural households, rural broadband access. In the next few years, rural areas will become the main source of Internet users in China, the mobile phone has become the main platform for the popularization of the Internet and the realization of the information technology.

The Internet into China 20 years, profound changes bring a full range of economic development, agriculture, transportation, energy, integrated into the health and education industries, has accumulated to a touch of Fayin burst change time, the Internet has become a new force on behalf of the engine of economic development and innovation driven development. The future, things will connect everything, O2O accelerated to open a new business model, industry cross-border cooperation will continue to innovate, to consumer Internet Internet industry migration evolution, the Internet will deconstruct each industry, stimulating industrial upgrading, the characteristics of almost all industries will present the pan internet.

3 The main problems of agricultural development

In recent years, with the rapid development of our economy and the improvement of people's life, the domestic demand for food is becoming more and more diversified, and other aspects of the food industry is also increasing. A lot of changes in the supply and demand, the price of food imports increased rapidly in 2014, China's domestic demand for soybean 87 million tons, of which 75 million tons, 11 million tons of soybean consumption of about 80% tons, of which 14 million tons, 4 million tons of domestic output, 6 million 400 thousand tons of cotton consumption, the output is 1 million 300 thousand tons, imports accounted for 20% of domestic consumption, the comprehensive grain self-sufficiency rate has exceeded 95%. According to the "national food security needs of long-term planning outline" forecast that by 2020 China's grain gap may reach 32 million 500 thousand tons.

On imports of soybeans and other staple agricultural products, the high degree of dependence of imported food sources are too centralized, constitutes a serious threat to food security in china. In addition, grain production in China is still faced with many negative factors: the scarcity of water resources threaten agricultural irrigation;

rapid growth in labor costs against the enthusiasm of farmers; yield slow growth; bijiexiaoying caused grain acreage to expand the limited development of agricultural production mode; lag; land pollution problems resulting in food production and crops has reached alarming proportions. According to research report released by the Chinese Academy of Sciences Institute of ecology in 2012, China is currently subject to cadmium, arsenic, chromium, lead and other heavy metal contaminated land area of nearly 20 million hectares. In January 6, 2015, the Ministry of Agriculture said China will start a staple potato strategy, not China is the food safety problem of choice under the grim situation.

With the continuous improvement of the degree of external dependence of agricultural products, the area of cultivated land is gradually decreasing, and the situation of the people and the land is much worse. According to the World Bank statistics, in 2014 China's agricultural population accounted for as high as 45.6% of the total population, while the proportion of agricultural population in developed countries is generally low, such as the United States only 18.6% of the population engaged in agricultural production. With that, the average per capita arable land area of China in 2014 is only 0.22 hectares, which is lower than the level of 1.1 hectares in the United States, even lower than the world average of 65.2 hectares.

The agricultural population continued to decrease and the phenomenon of aging is obvious in recent 10 years, with the rapid development of industrialization and urbanization and the difference between urban and rural infrastructure and social life, rural youth are flocking to the cities (towns), the younger generation is no longer willing to engage in agricultural production, the proportion of working age population is declining, the age structure of agricultural population is gradually changing with the aging population. According to the National Bureau of statistics released the "2013 national migrant workers monitoring survey report" shows that in 2013 the new generation of migrant workers (1980 and after the birth of) a total of 125 million 280 thousand people, accounting for 46.6% of the total migrant workers, accounting for 1980 and the proportion of rural workers born after 65.5%. In the statistical period, 87.3% of the new generation of migrant workers not engaged in any agricultural production, most of the main working away from home. "Migrant workers" heat has not been back, plus the emergence of China's demographic dividend turning point, the agricultural labor force in particular, to continue to reduce the age of school-age.

The development of rural economy has stalled and the improvement of production efficiency has become more and more slowly. Since 1997, the average annual growth rate of agricultural added value was only 6.88%, far below the 12.45% growth rate of industrial growth and 14.21% of service industry. And this is a relatively high proportion of rural labor and the lower agricultural production efficiency, the 2013 end of the total employment of agricultural population in China, and the proportion of the total employment population reached 34.8%, while in 2011, only 1.2% in the United Kingdom, Japan in 1990 has only 5.9%. From the perspective of income, rural residents in 2013, the first time beyond the income of household management, accounting for 45.2%, compared to the display of income, rural household management does not have the advantage. Agriculture needs to reform, and vigorously improve the level of agricultural intensification, in order to improve the efficiency of rural areas and farmers' income levels.

4 The comprehensive reform of agricultural development

With the development of land circulation and scale management, the new business entities such as cooperatives, family farms, and major industries are rapidly formed, which correspond to the emerging market players. The agricultural information industry is developing rapidly, and the modern agricultural products circulation, which is the representative of electronic commerce.

4.1 Land system reform

In November 2014, the central office of the State Council issued "on the guide of rural land management rights orderly transfer of agricultural scale operation and development of opinions", documents based on register right, ownership, contract rights, management rights division of powers, to guide the orderly transfer of land management rights, the development of various forms of moderate scale management. Land transfer reform is the important part of the reform, the reform of state-owned enterprises, the important part of comprehensive deepening reform. Three right separation (ownership, contract rights, management rights) is a major practice of agricultural reform, China's rural areas are facing unprecedented a comprehensive reform.

4.2 Business subject reform

Cultivate new agricultural business entities is the basis of the development of modern agriculture. Under the background of industrialization and new urbanization, the rural labor force to urban and rural labor transfer to cities and towns and the two or three industries, the reduction of agricultural workers, and the development trend of land scale management, will promote the transformation of business entities, the future of cooperatives, family farms and modern agricultural enterprises will become the main force of agricultural management.

Country in the policy and financial support, will further accelerate the formation of new business entities. Policy support, the Chinese Communist Party in the third plenary proposed to encourage the development of professional cooperation, joint stock cooperation and other forms of farmers' cooperatives, guide the operation of the norms, focus on strengthening capacity building. Encourage local governments and private investors to set up a financing Guarantee Corporation to provide credit guarantee services for the new agricultural business entities. Increase the new occupation farmer and new agricultural business entities lead people's education and training". Financial support, in February 2014, the people's Bank of China promulgated the new agricultural management, such as family farms and other financial services guidance, requires financial institutions to increase the credit support for new agricultural business entities, such as family farms, and make an inventory of the amount of funds to support family farms and other new agricultural business development.

4.3 Agricultural business model reform

The development of smart phones and wireless Internet technology to promote mobile phones become the main platform for rural information. 2014 rural Internet users use the proportion of mobile Internet access to 84.6%, the development of mobile Internet technology to promote the rapid coverage of Internet technology in rural areas, mobile Internet platform as a rapid release of the advantages, but also to the Internet technology and all kinds of Internet access to rural areas can be.

Agricultural industry has a large market space, industrial backwardness, the information asymmetry is more serious, the large scale of the user, the transaction process is longer, the transaction costs are high, the transaction is highly sustainable and so on, so the potential of the Internet is huge. From the domestic and international agricultural development trend, the Internet and agriculture has begun to accelerate the integration of agriculture, the Internet era has arrived, the Internet is the agricultural industry chain comprehensive transformation, from agricultural sales, intermediary services, the transfer of land to agricultural production, sales of agricultural products, with the Internet thinking of agricultural enterprises from all sectors of the agricultural industry chain on the active layout try to use the Internet, explore various business models.

5 "Internet +" to the reform of agricultural modernization

2015 central rural work conference to accelerate the modernization of agriculture as the theme, pointed out that we should adhere to the reform as the driving force to technology as the lead, to promote the development of agriculture, transfer mode, adjust structure. Further emphasis on increasing the intensity of reform and innovation. Reference to the development of modern agriculture, the scale, industrialization, modernization, industrialization and gradually formed, the future will further extend to the information, in order to build a modern agriculture, accelerate the transformation of agricultural development mode as the core of agricultural information into a bright spot. From the development of domestic and international, the Internet has begun to merge with the depth of agriculture, the Internet is a comprehensive transformation of agriculture in order to improve the efficiency of agricultural industry and agricultural informatization level.

5.1 Industrial chain business model change

Agricultural Internet era has come, the Internet is a subtle way to transform the whole process of agricultural industry chain, and promote the optimization of the industrial chain and improve the efficiency of the. Occur on the basis of effective promotion of large-scale operations, the Internet technology is expected to produce the whole process of agricultural products from production to effectively integrate, involving the whole process of agricultural product traceability system, cold chain fresh, brand agriculture, etc.. In the Internet mode, the agricultural industry chain will form a new

business model, to provide more space for the integration of agricultural and agricultural products market trillions.

5.2 Opportunities for agricultural service platform

With the advance of modern agriculture, the acceleration of land transfer, the increase of the main body of the new intensive management, and the way of agricultural modernization. New agricultural enterprises put forward higher requirements on the agricultural product supply and service. Coupled with China's huge market capacity of agricultural fertilizer, seed, feed, only three kinds of size over one trillion yuan. In recent years, Internet companies are "going to the countryside", to seize the rural electricity market, in the objective to cultivate rural business, stimulate the vitality of rural electricity providers to help agricultural development of the electricity supplier. At present, agricultural electricity providers model is the main mode and the third party business platform of agricultural enterprise self mode etc.

5.3 Information platform based on Internet of things

Things are recognized as the world's third wave of world information industry after the computer, Internet and mobile communication network. It is based on perception as the premise to realize the network of people and people, people and things, things and things. And the farm is through the sensing device to obtain crop information, on the basis of all kinds of network transmission, the central system for remote operation, information awareness - network transmission - decision support - remote control is the four basic chain of agricultural things. The essence of agricultural informatization is to transform the agricultural production from the traditional mode of labor to achieve efficient production by means of information, and to construct the Agricultural Internet of things that people and things are fully interconnected. From a broad sense, all agricultural information form of expression are in the category of agricultural things, the Internet of things is the soul of agricultural information. Throughout the country's latest application situation, the Agricultural Internet of things in the four areas of the main effect.

5.4 E-commerce platform for agricultural products circulation changes

2015 rural work conference pointed out that the circulation of agricultural products to support innovation, business, logistics, trade, finance and other enterprises to participate in the construction of agricultural e-commerce platform. 2015, the Ministry of agriculture also rural e-commerce as an important means to improve production efficiency, change management mode, the main business of agricultural production and business skills training, organization of agricultural production and business entities and business enterprises docking, to carry out agricultural e-commerce pilot and other aspects of the work.

6 Conclusions

The arrival of the information economy has brought new infrastructure, new elements, the establishment of the new division of labor, the establishment of a new agricultural product circulation model to provide a possible. Under the catalysis of the Internet, the distribution mode of agricultural products is changing, the new mode of electronic commerce is the main form of the rapid rise, in the main form of circulation, the organization, the impact of upstream and downstream, etc.

Acknowledgment

Funds for this research was provided by the National Science and Technology Plan Projects (2014BAD08B05), Science and Technology Projects of Shandong Province (2013GNC21006), Independent Innovation Projects of Shandong Province (2014ZZCX07104).

References

1. The CPC Central Committee and State Council on promoting the steady development of agriculture in 2009 to develop the sustainable income of farmers if the [Z]. (2009).2008 (12). (1).
2. Yan Xiaojun, Wang Weirui, Liang Jianping,. Beijing municipal facilities and agricultural application mode to build [J] Journal of agricultural engineering, 2012 (4):149-154.
3. Li Daoliang. The Internet of things and the wisdom of agricultural engineering, agricultural engineering, 2012 (1): 1-7.
4. Zhang Min, Chen Peng, China's agricultural networking status quo, challenges and thinking about [J] China's investment in science and technology, 2012 (9):38-41.
5. Shi Lianmin, Chen Zhifeng, cover of the Chinese Internet of things in the wisdom of the application of Agricultural Mechanization in agriculture research, 2013,6:250-252.
6. Yuan Changzheng based on the industrial economics perspective of China's Internet of things industry development analysis academic exchange 2011, (7): 115-118.