

Application and development of the Internet in modern agriculture

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Abstract: The importance of agricultural big data is becoming more and more important to people, in the industry market space will have a huge application development space, become an important strategic resources and important technical research direction, the deep integration of big data and agriculture is expected to become the gas pedal of the development of agricultural modernization. The collection and mining of big data is the first priority for the development of "big data + agriculture". Agricultural big data involves agricultural water, soil, light, heat, climate resources, as well as crop breeding, planting, fertilization, plant protection, process management, harvesting, processing, storage, mechanization and other aspects of the collection of multiple types of complex data, processing analysis, mining and application issues. Agricultural big data in the integration and sharing of a variety of agricultural data on the basis of in-depth mining and analysis, to find the hidden value of the data, can greatly improve the government's decision-making and management level, but also can really play out the role of big data on the development of modern agriculture to boost.

Keywords: Agriculture, Informatization, Big data, Internet.

1. Introduction

Today's society is an information age, the Internet is ubiquitous, through the computer and scientific and technological research and development technology and other means to analyze the problems of agricultural production, through the computer control of operating equipment, not only saves the labor force[1], but also able to refine the efficiency of the operation. Internet technology can quickly and accurately record information such as light time, adaptive temperature and growth process records of various plants, can analyze the growth status of crops through the computer Internet information center, if problems are found can be remedied in a timely manner, such as lack of water can be irrigated in a timely manner, so that the entire agricultural production process can be informatized, digitized, and intelligent, through the in the cultivation of the land, sowing, fertilization, disease prevention, harvesting, storage, breeding and marketing to improve agricultural economic efficiency[2]. The Internet promotes the transformation of traditional agriculture, which should be transformed into information-based agriculture to ensure that fine sowing, fine management, fine harvesting and re-processing can be achieved in agricultural production, and modern technology should be fully utilized to optimize the agricultural production operation, thus saving time and cost and maximizing benefits, and the main purpose of informatization and mechanization is to facilitate the operation of agricultural production and enable agricultural production to be carried out scientifically and effectively. The main purpose of informatization and mechanization is to facilitate agricultural production operations and enable scientific and effective agricultural production. Internet technology is a reliable basis for farmers' production and a demand for the development of modern agriculture[3]. With the help of the data and information provided by the Internet platform, many aspects of breeding,

cultivation, fertilization and irrigation are carried out in accordance with strict standards, which not only realizes the reform of traditional agriculture but also contributes to the standardization of agricultural production, and helps to improve the productivity of land, labor productivity, resource utilization, and input-output rate[4].

2. Application of the Internet in Modern Agriculture

2.1. Application in agricultural production equipment

The application of the Internet in agricultural production equipment, mainly reflected in the mechanical automation, such as GPS applied to large-scale machinery, can make mechanical autopilot, automatic seeding and fertilization, automatic spraying of the entire process completed at once, both to save production time and save production costs. In agricultural irrigation, through the analysis of soil moisture collection data on the farmland, the data feedback to the irrigation system to achieve real-time irrigation, standardization, intelligence, controllable, which not only ensures the growth of crops in need of water, but also saves water[5]. In farmland management, it mainly plays the role of monitoring and control, through which it can check the growth status of crops anytime and anywhere. Relying on the ground automatic meteorological observation station, digital weather radar, disease and pest data entry system and disease and pest data management measurement and reporting expert system, it realizes the intelligence of monitoring and prevention of disease and pest and natural disasters, so that it can be dealt with in time when it discovers the problem or the disease.

2.2. Application in agricultural production management

The application of the Internet in the management of agricultural production is mainly the use of the Internet to establish a rural service network platform, this platform can make the sharing of resources and information sharing, you can use the computer network to check which season is suitable for planting what kind of crops, you can also check the crops need to pay attention to matters such as the production process, you can also check the production of agricultural products and the real-time sales of agricultural products can be viewed at any time. On the Internet to buy and sell agricultural products, both fast and convenient[6].

2.3. Application in land management

With the development of China's economy and society, land management involves more and more content, in order to realize the standardization of land management and scientific, must establish high-tech land management[7]. And only now the Internet technology can meet the needs of land management now, the Internet technology can provide accurate data to land management, in the process of land management can use these data to realize the modernization of land management, the establishment of forest management information system, which is the most important is the fire prevention and flood control, the Internet technology can realize the real-time monitoring of the forests and the land, the use of a huge computer database to Combined with the actual topography and landscape, in the event of fire and flooding can be controlled and managed in a timely and effective manner, to achieve the effect of timely management and effective prevention[8].

3. Big Data in Agriculture

Through the establishment of databases on important agricultural products and agricultural products with special characteristics and advantages, it has realized the monitoring of national or regional key agricultural products and the regulation of the total amount of agricultural products. It makes full use of remote sensing monitoring, statistical reporting and channel collection data to build a large database of the agricultural industry and realize common sharing[9]. On this basis, it strengthens information processing such as data collation, analysis and modeling, prediction and early warning, data desensitization, etc., establishes a perfect market monitoring index system and early warning prediction and analysis system of important agricultural products and characteristic advantageous industries oriented to consumer demand, examines the supply and demand situation of domestic and foreign agricultural products markets, organizes experts to interpret hot market issues, makes full use of all kinds of media means, and warns of the risks of the market operation in a timely manner, and helps farmers to identify counterfeits and fake products, and prevents them from being used. It helps farmers to recognize and identify fake products, and prevents production from blindly following the trend and excessive speculation in the market. Regularly release important agricultural price information, enhance the timeliness of price information update and the accessibility of such information to farmers, and at the same time also support service organizations to provide personalized market information customized services for farmers and new business subjects to improve the accuracy and effectiveness

of the service [8], so as to better serve the agricultural production decision-making and market regulation and control, and as far as possible to avoid the convergence and short-term nature of the industrial structural adjustment caused by the information mismatch, and to avoid the production of the market and market speculation. convergence and short-term nature, avoid excessive price fluctuations, establish a supply system oriented to consumer demand, and better guide the in-depth promotion of agricultural supply-side structural reform[10].

Through the big data application platform, to realize the advantageous characteristics of agricultural products of the same region and the same species "online", producers unite on the online platform to achieve the online scale effect, which can unite the dispersed small farmers, promote the rational formulation of production plans, optimize the allocation of production factors, improve the standardization of small-farmer production[11], technology, and lead the offline standardized production with the online scale effect. The online scale effect leads the offline standardized production and improves the industrialization level. Encourage new agricultural management bodies and leading enterprises of agricultural industrialization to dock the Internet industrial platform, connect small farmers through the Internet, promote cooperation of the whole industrial chain, provide information technology services, and promote the sharing of information on land transfer and trading, and accelerate the construction of an Internet industrial platform that can effectively gather small farmers' production resources and distribute and open docking[12]. It is expected that agricultural big data will play a greater role in the process of implementing the rural revitalization strategy, fostering advantageous characteristics of the agricultural industry, and promoting the prosperity of the agricultural industry.

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References

- [1] CHENG Jie;, 2021. Research on the measures of "Internet+" to promote the development of agricultural economy[J]. *Agricultural Technology and Equipment*(02): 69-70.
- [2] Gui Song; Cai Hailong;, 2023. Internet agricultural information acquisition and adoption of farm machinery socialization services by farmers[J]. *Journal of China Agricultural University* (09 vo 28): 234-246.
- [3] Hong Xiao;, 2021. Research on the path of Internet agricultural revitalization in the context of rural revitalization[J/OL]. *China Market*(24): 61-62.
- [4] Liu P;, 2019. Research on the integration of internet, big data and artificial intelligence with agricultural economy [J/OL]. *Shanxi Agricultural Economy* (08): 76.
- [5] Luan Shengjie; Li Chenghuan; Yang Ming;, 2016. The development situation of modernized agriculture under the situation of Internet big data[J]. *Southern Agricultural Machinery* (07 vo 47): 65.
- [6] Ma Yue;, 2021. Analysis of "Internet + intelligent agricultural machinery" under the background of agricultural big data[J]. *Agricultural technology and equipment*(12): 93-94.
- [7] Mei Liwu;, 2017. Big data era: analysis of internet + intelligent agricultural production problems[J]. *Market Forum*(06): 48-50.

- [8] Miao Dewei;, 2020. Development status and countermeasures of China's "Internet + agriculture"[J/OL]. Jiangxi Agriculture (04): 46.
- [9] Pan, X.M.; Zhang, W.; Chen, X.H.;, 2022. Internet use and rural labor mobility: impact mechanisms and empirical evidence[J]. Rural Economy(02): 126-135.
- [10] Wang J. Analyzing the core idea of "Internet + intelligent agricultural machinery" under the background of agricultural big data[J]. Agricultural Technology and Equipment(08): 95-97.
- [11] YANG Jianqiang; PAN Qilong; 2020. Industrial characteristics, form and mode of Internet agriculture[J]. Food Industry(06 vo 41): 240-243.
- [12] Yang Weiyong;, 2019. "Internet +" to promote the transformation of the development mode of agricultural economy path[J]. Agricultural development and equipment(10): 16.