

1. Introduction

Agricultural production in China has changed from traditional mode to large-scale and industrialized mode. Traditional agriculture is turning to modern agriculture with machinery, improved varieties, water and fertilizer management, internationalization and informatization as its main contents. With the development of information technology such as mobile interconnection, cloud computing, distributed storage and agricultural internet of things technology, big data technology is penetrating into the agricultural field. Agricultural big data plays an increasingly important role in meeting the growing requirements of agricultural informatization.

At the same time, agricultural international cooperation is an important part of international cooperation and plays an important role in promoting international cooperation in “one belt and one road”. The application of big data in international cooperation has greatly improved the level of intelligence and decision-making ability of various industries.

2. Application Statuses

2.1. Big Data and Big Data Technology

Some American universities proposed big data at the beginning of this century, and then Amazon, Google, IBM and other international technology companies began to use the concept of big data and improve big data technology to improve their competitiveness in the industry. The explosive development of big data technology has brought about a variety of data collection technology, data storage technology, especially the infrastructure of distributed storage, data processing technology including data collation, cleaning and transformation, including various statistical and regression, clustering algorithm, intelligent algorithm and other data analysis technology, object-based similarity connection, network mining, behavior scoring. Data mining technologies such as analysis, image
recognition, emotional semantics analysis, modeling and prediction, machine learning technology and result presentation, etc.

In China, recent years are the development and maturity stage of big data. Our country regards the deep integration of informatization and national economy as a major strategic plan. Government departments, scientific research institutes and universities, social organizations and enterprises have made big data an important strategy, and the research of big data has expanded from academic field to application field. Big data technology penetrates into various fields of society, such as science and technology, government services, public opinion supervision, diplomacy, various economic industries, finance, medical treatment, education, transportation, logistics and so on. Governments, scientific researchers and enterprises have promoted the concept of big data to the dimension of information resources and thinking transformation. The strategy of big data development is affecting the political and economic pattern of the world.

2.2. Domestic Current Situation

In recent years, the CPC Central Committee, the State Council and relevant ministries and commissions have attached great importance to the development of big data and its role in the national economy. In 2015, the State Council promulgated several important documents, such as "Opinions on the Use of Big Data to Strengthen the Service and Supervision of Market Subjects" (No. 51 of the State Office for Development [2015])[1], and "Platform for Action to Promote Big Data Development" (No. 50 of the State Development [2015])[2]. The Ministry of Agriculture also put forward "Opinions on the Implementation of Promoting Agricultural and Rural Big Data Development" (No. 6 of Agricultural and Municipal Development)[3]. In 2016, the 13th Five-Year Plan Outline of the National Economic and Social Development of the People's Republic of China put forward the implementation of the national big data strategy, pointing out that "taking big data as a basic strategic resource, comprehensively implementing actions to promote big data development, speeding up the sharing, opening up and development of data resources, and promoting industrial transformation and upgrading and innovation of social governance"[4].

On May 25, 2016, Premier Li Keqiang emphasized at the China Big Data Industry Summit that Big Data is a diamond mine in the 21st century[5]. He must make up his mind to break through the data barrier and realize the interconnection and full sharing of data information at all levels and departments.

In China, a number of technology companies have been in the forefront of big data relying on their resource advantages. Ali, Tencent, Huawei, Baidu and other giants have launched large data platforms such as Aliyun, Tencent, Huawei and Baidu Intelligent Cloud. Baidu and others have a certain breadth and depth of research in data search, data mining and development, data analysis and data processing platform, big data products and data interface, machine learning, artificial intelligence, data visualization, etc. Huawei's big data tends to store and network, enterprise intelligence, flexible cloud server, database security, high-performance computing, machine, etc. Study. In addition, NetEase, Sohu, Qiushi, Xinhua and other media data platforms and products, pay more attention to data analysis and data product display; Metro and other evaluation data and instant messaging data, such as strangers, WeChat, etc. pay more attention to user behavior analysis; Mobike, AMAP and other data pay more attention to time and space data analysis.

In terms of agricultural big data, the Ministry of Agriculture launched the "Opinions on Implementing the Development of Agricultural and Rural Big Data" in 2016. The National Agricultural Big Data Center, led by the Ministry of Agriculture, has been launched with an investment of 30 million yuan. In this context, large agricultural data centers have sprung up all over the country. After several years of development, there have been a number of large data platforms jointly developed and constructed by government units of agricultural science and technology, scientific research institutes, universities and scientific and technological enterprises. Large data have a certain degree in agricultural science and technology, agricultural production, management, supply and marketing, finance and services. Application.
1. With the nationwide coverage of informationization in China, some large data platforms take agricultural macro-resources as the main object of construction. For example,

The National Agricultural Science Data Center is one of the national science and technology platforms recognized by the Ministry of Science and Technology. The Chinese Academy of Agricultural Sciences, the Chinese Academy of Aquatic Sciences and the Chinese Academy of Tropical Agricultural Sciences jointly construct it. With data source units as the main body and data centers as the backing, agricultural science and technology data resources at home and abroad are collected through integration, introduction and exchange, and standardized processing, classification and storage are carried out to form a network system covering the whole country.

China Agricultural Big Data, constructed by Breck Agricultural Information Technology Co., Ltd., has constructed regional agricultural big data center, integrated platform, website and client. The research scope includes agricultural data fusion, collection, management and visualization. Product services include intelligent decision-making of industrial planning, investment attraction, integrative solution of intelligent agriculture, modern agricultural precision students, etc. Agricultural credit support and risk management.

2. With the vigorous development of various data algorithms and the maturity of Internet technology, large data platforms generally adopt rich data visualization styles to generate data analysis results and reports. For example, the cloud platform of agricultural big data application led by Shandong Agricultural University has built a variety of BI subjects to visualize large data, and corresponding agricultural thematic maps have been generated based on GPS data; Agger Agricultural Data Network focuses on agricultural data products and analysis reports.

3. With the improvement of the Internet of Things technology and the establishment of agricultural crop growth model, some large data platforms choose the in-depth study of specific crop varieties, and select the large data of agricultural single product as the construction object. For example,

The large data center of Shaanxi apple industry, co-constructed by the Ministry of Agriculture and Rural Areas and the Shaanxi Provincial Government, takes the data of each link of Shaanxi apple industry as the key content of single-product large data construction, and carries out large data construction in the whole process of wisdom orchard, agricultural management production, pest forecast and early warning, circulation and consumption of agricultural products, output and price forecast, agricultural service and financial insurance, etc.;

The Hubei Agricultural Department led the construction of Hubei Agricultural Big Data Platform, focusing on the construction of lobster single product big data, including origin, output, output value, price, supply and demand, quality, circulation, consumption, international trade, brand and so on. Taking into account all kinds of agricultural industries in the province, the relevant units jointly built agricultural production and operation, agricultural supplies and agricultural machinery management, agricultural products traceability and so on. Brand building, market information monitoring and early warning, agricultural services and financial insurance, rural leisure tourism, agricultural scientific and technological achievements, precision poverty alleviation, land ownership and other big data.

4. With the active trade volume of agriculture and the development of e-commerce, some big data platforms take the big data of supply-demand relationship as the construction object. For example, Zhonggui net constructs big data on local agricultural product price quotation, characteristic agricultural products, bulk spot transaction, supply relationship, price monitoring, matching transaction and so on. It is not unique that the member agricultural data research center constructs big data on land price monitoring, bulk product transaction, supply and demand relationship and price monitoring, agricultural machinery, matching transaction, etc. Big data include agricultural products and related daily necessities.

2.3. Overseas Current Situation

In 2011, the Office of Science and Technology Policy of the White House of the United States established the High-level Oversight Group on Big Data to coordinate and expand government
investment in the field of Big Data, and led the preparation of the Big Data Research and Development Plan. On March 29, 2012, the U.S. government released the plan, which marked that the U.S. has upgraded the research and development of big data into a national strategy and regarded big data as a key factor in strengthening national competitiveness. Federal departments in the United States have carried out 82 major data related projects[6], covering many fields such as national security, energy, health care, aerospace, geological exploration, humanities and social sciences, with the help of large data technology to achieve technological breakthroughs in these fields. The aim is to enhance the ability of the United States to acquire knowledge from massive and complex data sets, to achieve core technologies such as large data collection, storage, analysis and sharing, to accelerate the pace of exploration and discovery in the field of engineering, to strengthen national security, and to train large data technology development and application teams.

On October 31, 2013, the British government released "Seizing the Opportunities of Data: The UK Data Capability Strategy"[7], which marked that the UK has upgraded the research of big data into a national strategy. The strategy deploys data acquisition and data security, data analysis, data sharing, national infrastructure construction, industry-university-research cooperation, and makes 11 action commitments to ensure the implementation of the strategic objectives, aiming to promote the UK's world leading position in data mining and value extraction.

In 2013, the French government issued the Digital Road Map, which marks France's upgrading of big data technology to national strategic high-tech. On July 4, 2013, the French Government issued the Five Support Programs for Big Data of the French Government, which announced its support for the introduction of data scientist education projects, the establishment of technical centers for access rights to databases and network documents, the establishment of raw data capital to promote innovation, and the establishment of big data projects in transportation, health and other industries.[8] It aims to seize the opportunity of big data development and promote the development of big data in China.

In June 2013, the Japanese government issued the "National Declaration on Creating the Best IT" strategy, which marked Japan's upgrading of big data into a national strategy. According to the strategy elaboration, the Japanese government will launch a data classification website to provide data from different government departments and institutions during the 10-year period. Japan's new IT takes the development of open public data and big data analysis as the core, aiming at promoting the development of big data analysis technology in Japan and formulating the best big data practice guide.

In February 2013, the Australian Government Information Management Office set up a cross-sectorial Working Group on big data topics and launched the development of the Big Data Strategy for Public Services. In August 2013, the Australian Government officially released the "Big Data Strategy for Public Services", which marked the upgrading of Australia's research on big data technology into a national strategy. The strategy elaborates the principles of big data technology: data is national assets and used for the well-being of Australian citizens, data sharing and development of big data projects should ensure data security, especially user privacy, strengthen data mining to achieve data integrity, technology, resources and other data sharing among government departments and between government and industry; carry out extensive cooperation between industry and academia, and strengthen data security. In addition, data analysis centers will be set up to enhance the data analysis ability of government departments and to train technical experts. The strategy aims to promote public sector service reform using big data analysis, provide public policy support, protect citizens' privacy, and make Australia a global leader in big data.

Technological enterprises in developed countries led by the United States are also actively developing big data business. Google is the founder of big data, and its troika: Google File System, Map Reduce and Big Table set off the global big data era. Google has published detailed design papers on these three products, which have laid the foundation for Hadoop and for big data algorithms that are popular all over the world.

IBM is one of the three largest IT giants in the world, and is the main participant and executor of Hadoop architecture. IBM's service customers are mostly PB-level big data. Its mature solutions, such
as Hadoop System, Stream Computing, Federated Discovery and Navigation, IBM Big Insights, have been widely recognized worldwide. IBM is proficient in many big data technologies, such as high performance computing, workload management for high performance computing, distributed computing, data management and modeling, BI tools, and has rich experience in many fields such as global data center and enterprise-level large data project implementation.

Microsoft, through its partnership with Hadoop, has a complete set of layouts in the big data infrastructure. Moreover, Microsoft's flagship product Windows has long occupied more than 90% of the desktop office share, and has a large number of applications in enterprise applications, which can use its ports to obtain large amounts of data resources. At the same time, Microsoft's open source tools Windows Azure HD Insight, Horton Works Data Platform for Windows and other large data solutions are well integrated into enterprise applications for enterprises. Provide internal data storage, management, analysis and sharing services.

Oracle is a well-known data-based, data-oriented leading company, its big data need not be elaborated, providing large data-related products and solutions including: Oracle Big Data Preparation Cloud Services, Oracle Big Data Appliance, Oracle Big Data Discovery Cloud Services, Data Visualization Cloud Service, etc.

In the field of big data cloud computing, Amazon can be called the hegemony. Amazon uses cloud computing to solve its own problems in managing super-large data centers and complex software systems, and develops AWS (Amazon Web Services) to export these technologies and experiences, igniting the global public cloud market. AWS provides a highly reliable, scalable and low-cost infrastructure platform in the cloud to support more than one million enterprises, governments and organizations in 190 countries and regions around the world.

Cloudera is the largest and most well-known company in the Hadoop ecosystem. It has developed many functions for its Hadoop distribution, including Cloudera Manager, for management and monitoring, and the SQL engine Impala. Cloudera provides an enterprise-level software platform for data interaction, which allows organizations to store, run and analyze large enterprise data at a faster speed and at a lower cost.

Teradata focuses on big data and has become one of the world's largest suppliers focusing on big data analysis, data warehouse and integrated marketing management solutions. Products include: integrated data warehouse, Aster Big Analytics Appliance, Data Mart Appliance, etc.

HP Enterprise's big data solution, Vertica Advanced Analytics, can be deployed anywhere across multiple clouds and commodity hardware on any Hadoop distribution system. It integrates an open source, eco-friendly architecture.

Dell acquired EMC (Easy Anxin) as a technology company mainly engaged in information storage, including information storage and management products, services and solutions.

Splunk is a company that started as a log analysis tool and has gradually expanded its business to analyze big data on machines. The tools can monitor online end-to-end transactions, conduct customer behavior research, and even conduct Emotional Analysis on social platforms.

SAP is a German enterprise whose main business is the solution of enterprise management. It applies business intelligence to the management of customer relationship, enterprise information, enterprise performance, resource planning, human resources, capital, product cycle and other processes.

2.4. Status of International Cooperation

Big data thinking and technology are also used in all aspects of international cooperation. From the perspective of knowledge and logic, Yu Shiyang and Yang Daoling studied the construction of decision support system for big data in the "one belt and one road" system, and put forward a diversified technical support system for service-oriented government and enterprises[9]. Some studies build a big data think tank platform from different perspectives such as agriculture, geography, trade and talent.
Some studies use text recognition and semantic analysis technology to conduct think tank research and network analysis on documents, scientific and technological information, while others use this method to extract elements of policy bulletin text and foreign news text, and carry out policy and relationship research[10,11]. Other studies have modeled and analyzed key political and economic variables in international cooperation, such as land, food and other important variables in international cooperation[12].

3. Problems and Prospects

Big data technology plays an important role in modern agriculture, but there is still a big gap from the growing demand for agricultural informatization. At present, there are the following problems:

1. The cost of large agricultural data acquisition is high;
2. The suitability of the influence of the complexity of the production process in the agricultural industry;
3. The application expansion of agriculture cannot keep up with the rapid development of big data technology;
4. Data monopoly and security risks.

In order to meet the requirements of large data and modern agricultural development, it is necessary for the government to take the lead, use administrative resources to form industry consensus, connect the "isolated islands" of large agricultural data, use financial resources to activate the scientific and technological vitality of enterprises, take the market as the guide, strengthen infrastructure construction such as agricultural Internet of Things and data collection, and develop data mining, cleaning and data analysis technologies. Demonstration and promotion of high and new technology.

In the field of international cooperation, there exist such problems as the non-linearity of emergencies such as international relations and policies, the unpredictability of large data analysis and processing, the urgent need for the development of text recognition and semantic analysis technology, and the hidden dangers of data security. We need to invest in scientific research to make breakthroughs in linguistic semantics and artificial neural networks, to analyze non-linear problems, to excavate relevant relationships, and to establish universal models.

4. Conclusion

Big data is the inevitable product of the development of the times. Big data resources are the important strategic assets of the state and enterprises, and have great significance for political, economic development and social progress. Under the current global strategic background and pattern, the research and application of big data theory and technology in China has developed rapidly, and has a good foundation, but also faces rare historical opportunities. In the field of big data of international cooperation in agriculture, we should study the application of big data in international cooperation in agriculture, study the application of big data in international cooperation in agriculture, study the application of big data in international cooperation in agriculture, form a stable triangular structure, further gather large data technology and resources, and accelerate the integration of applications. It can provide policy support and action basis from politics, agricultural economy, science and technology, diplomacy, food security and other aspects, and provide a new engine for economic and social development.

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