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# RESEARCH OF DEVELOPMENT OF AGRICULTURAL KNOWLEDGE SERVICE IN CHINA

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**Abstract:** With the global development of knowledge economy, the knowledge requirement of farmers is more personalized and solution-oriented, so there is pressing needs to develop agricultural knowledge service. The paper analyzes characteristics of agricultural knowledge service, and summarizes typical cases of agricultural knowledge service development in China.

**Key words:** agricultural knowledge service, solution-oriented, personalized service

## 1. INTRODUCTION

As Rural Informatization is more emphasized, a series of focus special projects are launched, such as the three electrics gather one, the integration of three networks, the rural remote education and so on, which have achieved very good results. But there are still some problems that the lacking of overall-planning and coordination-management, duplicate construction have resulted in wastage of funds; and urgently needed information for farmers is still inadequate. Agricultural experts' experience in the tacit knowledge does not be fully developed and utilized; and farmers' diverse information needs have not been deeply met.

What exactly was the need for farmers' information service? Farmers not only need the original information for retrieval, but also need comprehensive information, dynamic information, analysis and forecast information. They prefer one-to-one consulting service to general information service. In brief, they need the realistic solution throughout the whole agricultural production process, which is just the aim of agricultural knowledge service.

## **2. ORIGIN OF AGRICULTURAL KNOWLEDGE SERVICE**

The concept of agricultural knowledge service is rarely found in all kinds of literature. According to the paper of Design and Realization of Agricultural knowledge Service System Based on Internet, the agricultural knowledge service is a course of shifting visible knowledge which store in computer and invisible knowledge which store in agriculture expert's brain to farmer.(Zhou Guomin et al., 2005). Another paper of Comparison of Agriculture Information Service and Agricultural Knowledge Service added that agricultural knowledge service is special service industry built on knowledge and service functionality of institutions and libraries on agricultural science and technology intelligence research. For the goals of resolving the users' problems, according to users' special needs, high value-added service of intelligence is provided for users based on agricultural or other field knowledge.(Yanxia et al., 2008) The authors think that agricultural knowledge service is high value-added service of intelligence support and intelligence services just for agriculture, to meet special needs of rural and farmers, whose final goal is to resolve their realistic problem, and to promote knowledge of integration, innovation and shared.

## **3. THE CHARACTERISTICS OF AGRICULTURAL KNOWLEDGE SERVICE**

### **3.1 User-centered and aiming at users' satisfaction**

Knowledge service of agricultural science and technology institutions is totally user-centered to cater for the user's knowledge. According to the users' actually requirement, they select and gather a variety of information resource, and provide new knowledge production after refining, processing and reorganization, just for ease of comprehension and absorption. It is

emphasized that directly putting their own unique knowledge and capability into the agricultural production process, to help them resolve their own insurmountable problems, and provide users with the value of knowledge and creativity.

### **3.2 Solution-oriented and throughout the whole process of user information activities**

Agricultural knowledge service is committed to users' requirements, helping users finding or forming a solution. It is affected by several factors that the process of user information requirement generation and utilizing information to solve problem. With the change of external factors and user problem-solving progresses, the user information needs or behavior will change. Staying outside the user's information activities, if you do not see those changes, you cannot really solve the user's problem. Therefore, agricultural knowledge service require that they provide forwardly knowledge match users' constantly-changing needs. (Du Yeli et al. 2005)

Agricultural knowledge service must provide knowledge forwardly that matches users' changing requirements, and help them forming solutions, in the whole process of participation, comprehension, analysis of the users' information activities.

### **3.3 Facing knowledge innovation**

The most difference between agricultural knowledge services and traditional information services is that it provides value-added knowledge rather than simply transferring information. The process of value-added knowledge is innovation. They select all kinds of information resource, collating, filtering, and reorganizing in use of a variety of information technology, and eventually form new knowledge production for users. (Du Yeli et al. 2005)

### **3.4 Personalized service**

Agricultural knowledge service is always standing in the user's perspective, and measuring the knowledge and information to fit users, help users solve actual problems. Each user's scheme is targeted and specific. Exactly according to the user's information requirement characteristics and behavioral habits, agricultural knowledge service is realized by adopting the diversified and personalized service.

### **3.5 Comprehensive integration, collaboration and sharing**

Agricultural knowledge service is to integrate organically a variety of resources (including specialist resources, information resources and technical resources), play the overall advantages of the service sector in manpower and intelligence, information and technical resources. Based on open-service mode, through system integration, service integration, and team work, they joint, coordinate and utilize a variety of knowledge resources to provide knowledge-based services. (Du Yeli et al. 2005)

## **4. TYPICAL CASE ANALYSIS OF AGRICULTURAL KNOWLEDGE SERVICE**

### **4.1 Agricultural experts and decision systems**

The representative of the earlier agricultural knowledge service is agriculture expert systems. The Agriculture Expert Systems are designed to emulate the logic and reasoning processes that an Expert would use to solve a problem. The expert systems in agriculture are based on the integration of knowledge and experience of specialists from different fields, such as Agronomy, Breeding, Soil science, etc. These systems have the capability to answer relevant questions and explain its reasoning process and will be able to interact with farmers and end users in a way that can be understood by them. Expert System can be developed in any specific domain for some specific purpose. Supported by National 863 plans and the national important science and technology project During The 7th Five-Year and The 8th Five-Year etc, the expert systems about crop varieties, agricultural production management, and disease pest control are developed in China.

### **4.2 Pluralistic agricultural advisory services**

#### **4.2.1 Agricultural science and technology information service 110**

Agricultural science and technology information service model of 110 is a typical innovation model of rural technology services in the practice of the

Starfire Enriching Farmers. On the mission of science and technology services for farmers, to information resources as the core, to service hotline as a link, based on data networks, it is devoted to promote information low-cost and efficient communication in the wider rural, and realizes the zero distance between science-technology and farmers. (Zhangbo et al, 2007) The premier of China Wen Jiabao thinks high of the model as a creation of serving for farmer. The service model is mainly on information dissemination, but experts can directly solve the problems with telephone online, so it is one basic form of agricultural knowledge service.

#### **4.2.2 Agricultural experts two-way video Advisory diagnostic service**

Because the cultural level of farmers is generally ragged and not high, it is urgently needed that the methods of online farmer-expert interaction and consultation. It is possible with computer communication and streaming media technology. Since 2006, Institute of Agricultural Science and Technology Information of BAAFS carries out expert and farmer one-to-one video Advisory diagnostic services, implements real-time remote technology consultation, pests and diseases remote diagnosis etc. Farmers can transmit easily the sample pictures of field pests and diseases to experts by face to face through the video system, and experts will diagnosis and provide practical solutions according to the actual disease. Agricultural experts two-way video Advisory diagnostic service is orient-solution knowledge service, involved in agricultural production and management decision. It has received more recognition and welcome of farmers since it began.

#### **4.2.3 Agricultural engineering consulting**

Agricultural engineering consulting business is intelligence service industries, following independent, scientific and impartial principles, which provide advisory services of decision and implementation about agricultural economic construction and engineering for government departments and investors, to enhance the macro and micro economic benefits. Foundation and development of Agricultural engineering consulting is accompanied by rapid development of our agricultural investment management reform. In 1992, Ministry of Agriculture has established the Ministry of Agriculture Engineering and Construction Services Center and the Chinese Association of Engineering Consultants, as a sign of a formal engineering consulting

industry in China. until 2006, our agriculture engineering consulting organization has reached 50, the number of jobholders is up to 3000, and the overall strength and technical level is more improving. Agricultural engineering consulting fully utilizes the advanced agricultural technologies, insisting on the independently advisory services, and provide decision-making evidence for government and enterprises, thereby improving the investment results. In integration of expert teams force, orienting knowledge innovation service, agricultural engineering consulting is designed to add knowledge value, and realize effectiveness and industrialization of knowledge service business. It is relatively successful agricultural knowledge service mode.

#### **4.2.4 Agricultural knowledge integration and sharing**

##### **(1) Chinese Agricultural science data sharing centre**

Agricultural Information Research Institute of Chinese agricultural science Academy is in charge of national agricultural science data sharing centre. Based on agriculture sector, to meet state and society requirements on agricultural scientific data sharing service, taking the data source sectors as the mainstay, surrounding data sharing center, the national and international agricultural scientific data resource can be put together through integration, importing and exchange. The data should be standardized and classified, and eventually rapid sharing service network system will be constructed. With database construction, system application and providing service, they gradually expand the scope of building and sharing in China. At present, 13 categories of the huge database groups have been built.

##### **(2) Provincial and municipal agricultural science and technology knowledge-sharing center**

Since 2003, the provinces gradually established many regional centers of agricultural science and technology knowledge sharing, especially Beijing, Guangdong, Anhui. Beijing agriculture digital information resource center, for example, based on the services for urban style of modern agriculture in Beijing, under integration of agricultural experts' experience and knowledge, with a combination of centralized and distributed building patterns, realizes joint construction and sharing with agriculture-related institutions in Beijing, to meet the needs of local agricultural science and technology. Until now, More than 200 databases, millions of agricultural data has been completed, forming a dynamic agriculture knowledge warehouse. it becomes a comprehensive agricultural Center for digital information resource sharing in Beijing. In cooperation with county

government, the communication channels of agricultural knowledge is widened. As a result, it has been the main source of the agricultural knowledge in Beijing.

## **5. CONCLUSION**

Agricultural knowledge service is still in the initial stage in China. There are some meaningful attempts in the fields of the expert consultation, knowledge integration and expert systems. With agricultural knowledge economy growing, Only joint agricultural information research industries can complete the process of knowledge organization, communication, application and innovation. Meanwhile agricultural knowledge service is core competence power of information research industries. It is the all-dimensional and targeted solution that is deeply needed for farmer in fact, which require our long-term efforts for the topics.

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