

# Study on Agricultural Information Services in Technology Transfer Based on Information Push Technology

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**Abstract:** The efficiency of agricultural science and technology transfer is subject to the technology-self, the information communication, the development of agricultural industrialization and so on. Information service platform will help to improve the efficiency of technology transfer by optimizing agricultural resources allocation and promoting agricultural resources integration. The information service system based on information push technology sends users the processed information actively according his needs through various channels and means, so as to meet the users' individual demands for agricultural technology and information.

**Keywords:** Information push technology; Agricultural achievements; Technology transfer; Information service

## 1 Introduction

There are about 7000 agricultural science and technology achievements in china each year, but only 30% -40% of them are puted into productions due to many reasons, which is much lower than that of developed countries. The achievements which are welcomed by farmers("hot technology") are only about 10% of the total achievements, a large number of agricultural science and technologies are not turned into business and remain exhibits, which restricts the development of agriculture and rural economy and be a great waste of science and technology<sup>[1]</sup>. The service system of agricultural science and technology based on information push technology integrates, processes, analyzes, stores, classifies the achievements and finally transfers and pushes them to agricultural enterprises, factories and farmers to meet their needs<sup>[2]</sup>. It will improve the service of technology transfer and advances the support of science and technology to agriculture and rural economy.

The aim of agricultural science and technology transfer is to optimize and integrate agricultural resources, advance agriculture productivity and achieve the combination of science and technology and agriculture. Therefore, the state has launched a variety of projects to build a platform to promote technology transfer in which information service project is an important part.

## 2 The Constriction of Agricultural Science and Technology Transfer

As agricultural research, agricultural extension and farmers training and education are separated from each other and lack of co-ordination, there are large gaps between agricultural researchers and promoters, extension workers and farmers, science researches and its promotions. It leads to inefficiency of agricultural technology transfer<sup>[3]</sup>. In the vast rural areas, the poor communication networks and other infrastructure result in communication barriers between farmers and researchers, a lot of new technologies can not be known timely by farmers, and farmers' technology needs cannot be learned timely by researchers.

In the rural family contracted responsibility system, family is the basic production unit and the farmland is contracted dispersely by each unit, so a family is unable to against market risks and afford agricultural technology researches and purchases. Objectively speaking, the small-scale decentralized production of the land is not conducive to the application of large integrated agricultural technology.

### 2.1 The development of agricultural science and technology transfer

In the 21st century, "The First Documents" of central government have pointed out to build diversified agricultural technology extension system to promote agriculture science and technology innovation and its objectives for many years. With the support of national political policies, governments and some universities have made some explorations and attempts, and also opened up new channels for technology transfer through effective "Organizational Innovation" in the original science and technology management system to promote technology transfer, such as Engineering (technology) Research Centers, Technology Transfer Centers, University Science and Technology Parks. Information platform of agricultural science and technology transfer played important support function in the communication of suppliers and buyers, and settled some problems caused by asymmetric information

effectively.

## **2.2 The role of information service platform to technology transfer**

Because of the long production cycle, the benefit of agricultural science and technology is effected by physical geography, social, economic and technological conditions and farmers' technology acceptability and other comprehensive factors, so the information service platform plays essential support functions for suppliers and considerably decides the transfer results. At the same time, because many different departments are involved in the process of agricultural science and technology transfer, including the suppliers - agricultural research institutes; the buyers - agricultural enterprises and farmers; intermediate organizations - technology markets or the local transformation institutions; regulators - the government. Information service platform can coordinate the interests of all parties in this open systems, reduce the information asymmetry between the two sides, and help to build an integral technology transfer system by promoting the cooperation and communication between suppliers, buyers, intermediate organizations and government.

## **3 The Support of Information Push Technology to Information Service System**

Information push is a system of information issue and dissemination technology, relying on the technologies of information collection, artificial intelligence, knowledge discovery, network, data mining and database storage, it actively send the information after collection, analysis, extraction and categorization to users through certain channels or ways according to some technical standards or protocols<sup>[4]</sup>. The support is mainly the following areas.

### **3.1 Making information purposeful and pertinent**

As an active information service, information push technology changes the information access method, the system push the information to users according his personal need. In the vast rural areas, it can help users find the useful information efficiently in the mass of information with few participants, and push the most helpful one to each user pertinently<sup>[5]</sup>.

### **3.2 Saving information search cost**

Information asymmetry problem is serious between suppliers and buyers in rural information markets, so information sorting system in information service platform will extract and register some key words of technology information in the data to facilitate information search.

With information collection, analysis, extraction, classification, integrate processing, standardization and other steps, it can be push in accordance with the demand of users and reduce the research cost.

### **3.3 Realization of multi-dimensional and multi-media publishment**

As the information push technology is based on digital storage, science and technology information can be multi-dimensionally published anytime, anywhere and anyway. Meanwhile, by extraction, sorting and classification, information can be published though different media according its type, for example, the refining contents are fit for SMS access, the detailed contents for network access.

### **3.4 Breaking through the restriction of knowledge**

It is easy for each users to use information push technology, they do not need to have much professional knowledge and search technique, so it can be widely used in Chinese rural areas.

## **4 Function Module Design of the Information Service System Based on Push Technology**

Agricultural science and technology transfer information platform is a system based on push technology, which includes several basic modules.

### **4.1 Database module**

Database is the most important part of information service, including users database and technology and science database. Users are categorized according their needs in users database which collects and records the service information of each user, the system can track, record and store the information when user is searching, downloading and browsing, so to identify every user's features and interests and satisfy the needs accordingly. The database establishes a set of simple and complex index system and index key words, so as to meet the requirements of different media<sup>[6]</sup>. Meanwhile, the database also supplies the information of market supply and demand, prices of agricultural products, agricultural news, policies and regulations, agricultural technical standards, weather, pest and disease prevention and other agricultural information.

### **4.2 Collection and filtering module**

By collecting and filtering information, this module automatically track the users database and the

technology database, take the initiative to collect the user interested scientific and technical information, and finally push them to users by messages, e-mails, telephones and other media<sup>[7]</sup>. Building users interest model based on the users' initial registration, it will real-timely record various information when users are searching, downloading and browsing and add them to users' dynamic expansion information database, with the increase of each user's interest information, the system will be more efficient in information pushing<sup>[8]</sup>.

#### **4.3 Information PUSH MODule**

Information push module, information pull module (acquisition)and information screening module get together to form a complete system, information push and information feedback are the interaction between system and users. Before information push, the system will first judge the user's grade by the users interest model, if the user's grade is low, short message will be used, and the lower the user's grade, the less information is pushed. With the information increase when the user are browsing, downloading and asking questions, they will be stored to users dynamic expansion information database and raise the user's grade. The higher the grade, the more information is pushed, and the push means will also be extended from short message, e-mail, real-time chat software, telephone to personal staff; the information forms will change from short text, graphics, image, sound, program to operation program with the increase of information. In this process the users interest module judges, gives program, and send to the staff.

#### **4.4 Trading registration system and real-time expert service system**

Trading registration system and expert service system is the security system in the whole agriculture information service system, the trading registration system is designed in accordance with certain procedures and process to record and register the science and technology, the trade of information, to real-timely trace the details of the consultation, introduction, negotiation, transaction, and accounts. Real-time expert service system is composed by the techniques of experts service, intelligent information search, natural language process, artificial manipulation, to give technique support after technology transfer, remote training services, diagnosis judgement guidance, and the match of demand and supply.

### **5 Conclusion**

Information push technology actively transfers the processed categorized information to users through various channels and approaches, therefore, it is widely applied in the information services in rural areas to promote agricultural informatization. To make it more efficient in agricultural science and technology transfer, we should improve the system construction. First of all, mass of science and technology which is of applicability and timely, accurate information are the foundation of systems, to support the operation of the system, the administration apartments need to build science and technology database, the agricultural information sector also need to provide technology information. By the establishment of information collection, information filtering procedures, we can push the most useful information to the users and reduce the time cost of the users. Meanwhile, minimizing the data at one time pushing and using different media will reduce the cost. Third, it is important to improve information security system to protect user privacy from abuse including the user's interests, hobbies and other informations, to guarantee the reliability of the pushed information and the intellectual property protection.

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