Service modes of agricultural information based on network technology

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Abstract: In China, agricultural informatization has been developed, but still confronted by problems because the unitary of the service modes of agricultural information and the information is not being fully utilized.   Innovating of the agricultural service information mode is the significant to figure out the problems.   From the perspective of network technology, system analysis methods, this paper discusses the agricultural information service modes which are appropriate to China's modern agricultural development.   Processes of the real issues were studied by these methods and analyzed the Trading Platform of National Agricultural Science and Technology Achievements Transformation.   The research summarizes, how network platform serves in modern agricultural production and the means of information technology that would be implemented in the agriculture, the countryside and farmers, while referring to the meanings of agricultural services, agricultural information distribution and advanced foreign service model.

Keywords: network technology, service mode of agricultural information, trading platform

1   Introduction

Since the China's reform and opening up policy, the country side is the foremost edge for information spread which robust the China's agricultural mechanization and commercialism. But the development of agricultural infrastructure informationization is still deficient. China is facing the challenge of the transmission of information services, moreover the agricultural information resources are also not being used efficiently due to the restraints of rural information network and that the peasantry has less opportunity to acquire related information and guidance. Normally the farmers bank on experience or references of proximity farmers regarding their agricultural activities. At present agriculture informatization in China has a weak basis and delimited by many issues which include

overall quality and quantity of information resources which do not accomplish the needs of agricultural production and research. The number of agricultural information services still trails the traditional modes. Modern technologies and Innovations in agriculture-related services would resolve listed problems meritoriously.

The agricultural information service perception is classified into the narrow and broad categories. The narrow category refers to departments, research institutions, agricultural information gathering carried out by commercial companies to meet the service object, processing, transmission, agricultural advisory services, support and research for agricultural information technology and varied productions of agricultural information. The broad category includes the supply chain and technological information, production process, transportation and products sold in agricultural production.

The information dissemination method is pivotal. Agricultural information dissemination pathways should

have the characteristics of simplicity, richness, smoothness, target consistency, practical implementation, rational layout, fewer intermediate links and other basic requirements. From a practical view, channels and methods of information services should be based on local infrastructure and finical status of the users. Common communication channels used by farmers are mainly television, followed by verbal referrals among vicinity. Computers and networks have arisen and have a massive development potential in various rural areas, but currently are used for learning and entertainment, which doesn't really play a supervisory role in agricultural services.

2 National Agricultural Science and Technology Achievements Transformation Trading Platform

National Agricultural Science and Technology Achievements Transformation Trading Platform (NASTATTP) is a comprehensive service platform consisting of technology, talents, funding, policies and other elements to provide information on China's scientific and technological achievements in agriculture. As Figure 1 depicts, NASTATTP consists of resource integration sub-platforms, science and technology achievement appraisal and assessment sub-platforms, scientific and technological achievements transaction sub-platforms, research cooperation sub-platforms, policy support service sub-platforms, management and technological achievement sub-platforms, testing service sub-platforms and technology investment and financing sub-platforms.

NASTATTP is based on the application of the Internet, primarily being utilized to further enhance the transformation rate of agricultural scientific and technological achievements. It will provide muscular support for the industrial development of agricultural science and technology. The platform purposes the support of policy, supply and demand information, expert services, transaction services, technology investments and financing for both sides of transaction. There is a need of development tools for these applications because they require a complete support system, a large database technology and a large number of dynamic technologies.

NASTATTP's operating system is a Windows Server, uses Visual Basic NET (VB.NET) as a development platform tool and Structured Query Language (SQL) Server 2008 as the database software. Its web page was designed by Active Server Pages.NET (ASP.NET), VB.NET and so on. The database contains large amounts of information and many different data types. NASTATTP will significantly improve the level of transformation of scientific and technological achievements in agriculture, which makes agricultural scientific and technological achievements more user friendly, efficient and standardized. Moreover NASTATTP will explore the idea of China's agricultural information services and will integrate scientific research, technology, capital, products and other factors. It brings the work of government departments, research institutes, agricultural colleges, agricultural enterprises and other units together for the agricultural achievements transformation and trading. NASTATTP is a service integrated agriculture platform.
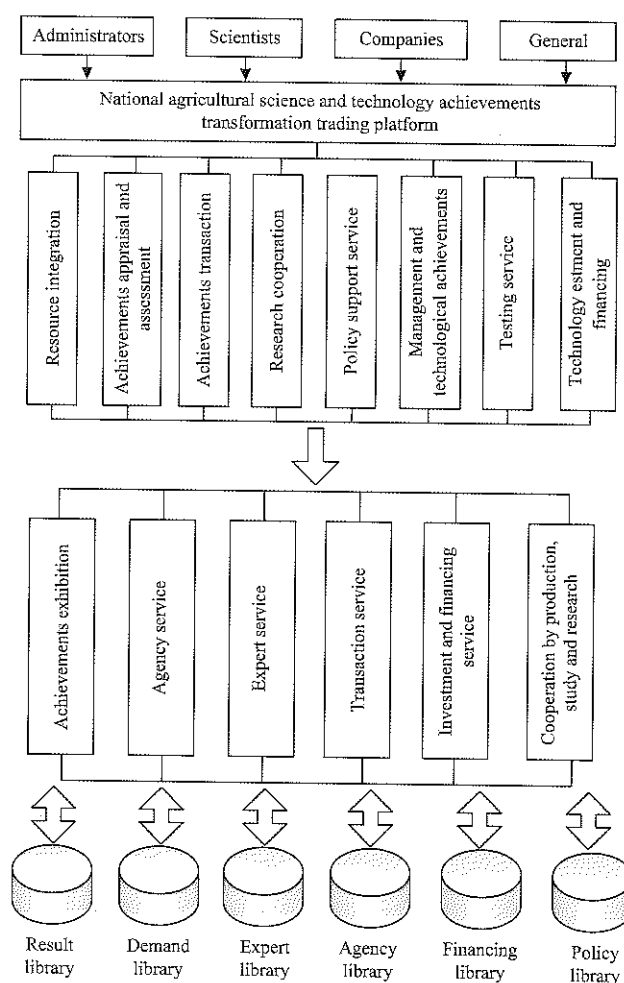

Figure 1　NASTATTP system module

3 Several methods of agricultural information service

3.1 The traditional methods

Traditional information services provided agricultural information to rural areas mainly through television, radio, billboards and other media. Since 2013, national radio broadcast covered 97.79% of the population and television coverage 98.42%. During the 12th "Five Years Plan" period, China has greatly improved the coverage of cable TV and internet in rural areas. Presently, radio and television are moderately trusted way of information dissemination in rural areas. Now internet is gaining huge popularity with the change in technology and the traditional means need to upgrade its services in order to meet the requirements of the industry and field.

3.2 Information service platform based on Internet

The network information service model uses big data of the internet for information processing (collection, selection and processing) and sharing so that it may be useful for the consumers through the information service system, which usually occurs on a network service platform, official micro-blog, professional forums, etc. Farmers often obtain useful information on the Internet because internet has a variety of information resources. The flexible web structure and lack of restrictions are the problematic features of the Internet. In network environment a person simultaneously may have dual role i.e. may be a provider or may also be a user of information services. The conditions of the implementation in this way rely on the Internet and computers. This situation is fairly evident in western part of China. The lack of awareness hinders the farmers from the network information service. However, less use of network resources certainly doesn't mean a lack of demand on the network in rural areas. The news has been reported that piles of oranges or apples cannot be completely sold. This phenomenon takes place because of the relatively backward economy and blocked channels of information in the rural areas. The most efficient way to solve this problem is through the network. From the current situation, the most important functions of providing networks for rural areas are with the latest planting techniques, problem-solving methods and online trading information.

3.3 The role of mobile phones in the agricultural information service

In recent years, mobile communications have been developed rapidly in China, playing an increasingly pivotal role, especially in rural areas. A report said, according to Ericsson, mobile phone ownership rates in rural China rose 90%, and about 50% new subscribers are from the rural market of China. The phone has the advantages of deep penetration rate, mobility, easy to operate and low cost. It should not be underestimated as the potential client's main source of information. Taking the phone as an information tool, there are three main forms: Short Message Service (SMS) group, expert hot-line and landing agricultural information service platform.

During the recent years, China has been establishing agriculture messaging service platforms in many areas. The content of information services includes news, market, practical techniques and meteorological information. In SMS group services, mobile Internet providers upload information to the SMS platform server by the client, after editing short message, and then local farmers will receive the information from the SMS platform. The "12306" SMS platform has carried out, sustained and stabilized the agricultural SMS service for every user in Jiangsu province twice a week, delivering to a total of about 70,000 users, which has widely improved the agricultural information dissemination system in that area. SMS information service's most projecting advantage is its excellent appropriateness and efficient delivery. SMS messaging performance limitations are that its short content and so is not capable to solve practical characteristics in detail. There is still a extensive work for the agricultural authorities to do to close the gap between agricultural information service and mobile operator so that quality of information services would be optimized.

Expert Hot-line information service was one of the first attempts to mobilize rural information dissemination. It aims mainly at farmers' eager to learn about new agricultural technologies and solve their practical

problems that they encounter in the attempt to utilize new agricultural technology. Previously they often relied on radio, television and other traditional media. There has been a typical cooperation between Chinese Agricultural University Graduate Student Union and the Chinese People's Radio "Village Voice" Channel. One of the stations called, "Agricultural Dr. Online", is not only for farmers to solve practical problems, but also to provide the stage for the experts with professional knowledge. With this method, the investment cost is small, operation is simple and the effect is more obvious. It also establishes a direct link between agricultural research and agricultural production. However, this approach has an obvious flaw, namely its fragile to create sustainable service and effective tracking guidance. The hot-line method on the market is limited because questioners cannot explain the problem in detail, so agricultural experts just guide in a general way with their experience and existing knowledge. We need a more open information service platform to bring issues together to discuss and solve the apparent never ending stream of issues. Conditions gradually mature that we should vigorously develop the rural smart phone market with the tendency that more people should choose to use smart phones, the technology should more convenient to buy and telecommunication operators expand their sales channels in the countryside. In fact, the rural mobile phone network has a high proportion of smartphones, some areas have even exceeded over 80%. Operating mobile devices is relatively simple, even if farmers are not first guided by other people. Landing agricultural information service platform as an access to provide agricultural services information by smart phones has the advantage of time and space compared with computers, the application of 3G/4G networks brings a more affluent multimedia experience. Smart phones have network access, decent growth capabilities, more powerful hardware configuration and so on. It is a very decent choice to build technology-based agricultural information relying on the Internet and mobile communications service platform with smart phones as terminals for the agricultural information services.

4　Discussion on agricultural information service

Network media has featured a wide range of products used for information broadcasting, express communication, rich content and expedient access, which collectively signifies a new projection for agricultural information services. Network technology will not only change people's way of life, but also will upgrade the agricultural industry. Network technology utilized in agriculture initiated in the late 1970s, so 40 years development makes this technology applied in agriculture more and more widespread. Agricultural information collection on the network will be used or referred through developed the special agricultural database system. Useful information about crops and agricultural technology will be published on a regular basis through the agriculture information service platform. Factual and effective supervision SMS would be circulated through messaging platforms. The application of different network technologies will exhibit the exceptional advantages of modern information technology. Network technology applications in the field of modern agriculture continue to expand, with the supporting fact that the use of smartphones has become relatively common. Combining network technology with wireless communication technology will further stimulate the development of agriculture network applications.

Xiaoguang Liu described the role of Land-Grant colleges in the development of agricultural service system in the US and its enlightenment to China. They serve as the main agricultural system and expand the scale and scope of services for agriculture and build the basic framework of the organizational system, strengthening agricultural services. China has diverse resources, complex terrain, large regional differences, less arable land per capita. Therefore this approach is not appropriate for China, but there are some researches which would be taken into account for the development China's integrated agricultural services system. In accordance with the concept of organic unity, the land-grant college teaching research and social services come together, and then China has the opportunity to set up an online service

network, which will mainly be reliant on agriculture-related institutions in the development of China's own modern agricultural service system. Thus, this puts great significance on the agricultural cooperation of teaching, research and technology promotion services. In 2013, the new concept of "family farm" first emerged in China. This kind of practice give the impression to encourage and support large contracting land, circulated to the professional and family farms or farmers' cooperatives. Large-scale and intensive agricultural land offers the possibility of combination of production, teaching and research. This is just the preliminary conditions of the combination. Besides, China also needs to narrow the common interests among the agriculture, the countryside and farmers, and achieve an unobstructed communication channel.

The application of the network as an agricultural information service tool will face a serious problem with the recipients' weak ability and awareness about the network. It can be considered that the best combination includes the Internet with the base service effect of village committees, neighborhood committees or farmers' organization. During the period of 12th Five Year Plan (2011-15), the development of agriculture, the countryside and farmers which aimed at promotion of rural agricultural informatization in China, laid a foundation for the application of internet in rural areas in China, therefore, fundamentally realizing the network coverage to each village. At present, it is impractical to let every rural household have the ability of using the internet. There is little difficulty in training the small amount of needed experts with the ability to use the internet through two levels of sections and townships. Some people will be trained to serve for the valuable agricultural information dissemination in villages. Grassroots organizations and local government initiatives should be brought into play and should be an important role in connecting villages with the Internet information service platform as a service terminal to a certain extent, this approach alleviates the contradiction between the rural demand for information services and the shortage of infrastructure.

Network information services also have the potential of deep penetration into the traditional media through the process of network information agricultural dissemination. The main advantage of online media are its rich resources, timeliness and interaction. Traditional media rely on professional editing power, high quality, and the news media credibility. These are key points that network has not yet developed enough to be successful. Therefore traditional media will not be completely withdrawn from the system in the short-run in response to facing the strength of the network. By establishing mutual benefit and complementary advantages, there should be useful link between network and traditional media. Network will primly merge in traditional media. Staffs from television, newspapers, radio and internet media will be rooted through certain channels in the combination of the network and traditional media. The contents from each medium could be reproduced, modified or commented by the other. This is good for using the advantage of traditional media in rural areas, solving the problem of insufficient network in rural areas and allowing them to still play a role. It will also promote traditional media's constructive transformation for the traditional methods to adapt to the modern development.

5 Conclution

Agricultural informatization is the essential characteristics of agricultural modernization in the information economy era, and it is also an inevitable trend of agricultural development. In this paper, we analyzed the National Agricultural Science and Technology Achievements Transformation Trading Platform, and discussed the service modes of agricultural information. With the development of network technology, it will further uplift the development of agriculture network applications and makes better information service.

Acknowledgments

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