Study on the Way of Production, Life and Thinking of Farmers in Mobile Internet Era

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Abstract. The mobile Internet and 3G mobile terminal has brought profound changes to people's life in the city, and also affected the way of production, life and thinking of farmers gradually. Due to the surveys conducted in various counties of China, Farmers are possible to obtain and share mass of external information and communicate with others far away from them whenever and wherever. However, the mobile internet just solved the hardwares of information acquirement. How to get the useful information, how to identify the information and how to use the information? All these questions have always baffled the farmers. Based on that, the author put forward suggestion as using cloud computing and cloud services to integrate and share agricultural and rural production and living information, equipping grass-root agricultural technician with 3G terminal to help farmers dealing with practical problems in agricultural production and using SNS to help farmers setting up mobile Internet social relationships for information sharing to solve all these problems in mobile internet era.

Keywords: Mobile Internet, Farmers, Cloud computing, agricultural technician, SNS

1 Introduction

Mobile Internet is a whole body that combines mobile communication with Internet. With the rapid development of broadband wireless access technology and mobile terminal technology, people are eager to access to Internet for getting information and services whenever and wherever, especially leaving the computer. In recent years, mobile Internet developed rapidly, at the end of the September of 2012, the global mobile Internet users reached 1.5 billions.

In recent years, the China has been committed to product agricultural production and to develop sustainable agriculture in many rural areas. For the purpose, developing and training farmers is the most essential issue in China. Currently, experienced farmers are seriously exhausted and few of them prefer staying in remote areas. Because of the large population of farmers and complex agriculture industry structure from the western world, developing agricultural ICTs in Chinese farmers needs to adopt special way.

Farmers as a special and large group in China, what they are effected and their response is an important issue related to the future and destiny of the country, and will directly affect the implementation of long-term sustainable development strategy of China's agriculture and rural areas. In view of this, the aim of this paper is to analysis the way of production, life and thinking of farmers in mobile Internet era, find the Find the crux of the problem, advantages and disadvantages of the mobile terminal that affected the farmers. Following that, combined with the characteristics of the application of mobile internet in recent years, this paper put forward some countermeasures, that is using cloud computing and cloud services to integrate and share agricultural and rural production and living information, equipping grass-root agricultural technician with 3G terminal to help farmers dealing with practical problems in agricultural production and using SNS to help farmers setting up mobile internet social relationships for information sharing to solve all these problems.

2 Survey and Methods

2.1 Experimental Samples

Since 2010, Agricultural Information Institute, Chinese Academy of Agricultural Science (AII-CAAS) have conducted an ICT demonstration program in Miyun county of Beijing(north of China), Xinhua county of Jiangsu Province(east of China), Linyin county of Henan Province(Middle of China) and Turpan region of Xinjiang Xinjiang Uygur Autonomous Region(North-east of China). That is to guide the demonstration farmers and agricultural technicians to use smart phones(3G) to improve their ability to get agricultural information and participate in online communication. Based on that, this survey was conducted in these four counties and 120 farmers was interviewed in September 2012.

2.2 Experimental Methods

The purpose of the research is to deeply probe if mobile internet and terminal better support farmers' long term agricultural products, agricultural development and rural life.
In the research, the author address farmers' background and problems through exploratory study that utilizes grounded theory approach and use triangulation method to developing and refining research questions and data collection. The epistemological perspective is oriented toward cataloging and developing explanatory frameworks for the variety of behavior patterns that are becoming increasingly obvious to all systematic observers.
While in interviewing, the author will collect data to describe and test the data through surveying/observing in the research process.The research will focus on Key informant interviews and a focus group to analyze and identify strengths, weaknesses, opportunities and threats (SWOT) of the research program. The interview is a conversation to get specific information and deep drawing research theme. During the

interview, the author will encourage participant to describe his/ her background or successful experience to make a relax atmosphere, and it will design a questionnaire to probe the program and guide the topic around the purpose.

According to the surveys and data, the research put forward suggestion for the decision maker, technicians and farmers in mobile internet era.

3 Way of Production, Life and Thinking of Farmers in Mobile Internet Era

The mobile Internet and 3G mobile terminal has brought profound changes to people's life in the city, but also affected the way of production, life and thinking of farmers.

3.1 Effect on way of production of farmers

Farmers usually adopt the very best picked seeds, fertilizer and pesticide to improve productivity. However, they are more eager to obtain more instruction on anti-pest management, updating planting techniques and changing conventional farming methods in the light of the market needs. With the rapid development of modern network and information technology, relationships between production information and farmers have been brought into closer connected.

3.1.1 Acquire agricultural production information from various of channel

In recent years, many farmers are possible to use mobile internet to obtain mass of external information whenever and wherever, and no longer confined to traditional literature, newspapers, radio, telephone, television. However, in the past, they need to go to information center in their village or town to search information online. Many farmers have learned not only to browse the webpage, but also to use blog, micro-blog, wechat to communicate with others far from them, such as in another town, county or province. They   actively joined or establish QQ group, circle of interest to share information and exchange agricultural production information, so they can introduce new varieties of crops or vegetables,or new technology, machine to improved the yield and their income. They have no longer played a passive role for acceptance of knowledge and information, but actively choose to get the information they need.

3.1.2 Change the structure of agricultural production

Various channel for information acquirement have facilitated the farmers to be educated, and also significantly enhanced the farmers' creativity. Many farmers are no longer limited in planting traditional crops,livestock and Aquatic product, they started to plant and raise special, superior product to get more money. Some farmers are no longer limited to land management, they started to set up their own workshops

and factories because they are easy to learn new technology and get help from professional people through mobile terminal and internet.

3.1.3 Increase the risk of agricultural production

In mobile internet era, mass media provides us some inaccurate and false information all the time, that will make the farmers easy to lost money. Some farmers got the false information from micro-blog, wechat or webpages and trust it without field investigation, then suffered tremendous of losses. But on the other hand, in some underdeveloped rural areas, the asymmetry of information make the farmers in inferior position in market,the farmers are difficult to grasp market information timely for planting structure adjustment, so they can not produce marketable products and can not get good price.

3.1.4 Improve the systematism degree of agricultural production

Convenient information acquirement and communication will gradually lead the farmers to produce in a professional way. Variety of production cooperatives, farmers associations, professional and technical associations, leading agricultural enterprises and family farm have come into being. Farmers can obtain production and market information systematically whenever and wherever.When the farmer's individual rights and interests are violated, the organization agent on behalf of individuals will conduct the negotiations with counterpart to safeguard the interests of farmers. Before the production, farmers will plan and adjust the production structure according the analysis market supply and demand information, during the production, farmers can get the help from experts or massive information online, after the production farmers can release sales information of farm product by mobile terminal at any time. Farmers have swinged from individual management to intensive and scale management, and become the real competitive market players.

3.2 Effect on way of life of farmers

The popularization of terminal and mobile Internet not only provided the farmers a variety of educational opportunities and sharing of information resources, but also changed their life style.

3.2.1   Enrich the entertainment of farmers

With the popularization of a variety of mobile phones, application software and network everywhere in rural areas, farmers have opportunity to enjoy more cultural exchanges and entertainment services, that have enriched their spiritual life, and improved their quality of life. In the past, while in slack season, farmers usually spend leisure time on playing cards and mahjong. But now the farmers can not only watch

TV, but also can use intelligent mobile phone to contact with the outside for booker, buy stock, read the news online, watch movies and play games etc..

3.2.2 Facilitate farmers' life

Mobile internet facilitate farmers' communication with outside. They no longer have to worry about going out and lost outside. As for management of village affairs, meeting and discussion and marriage event in rural areas, they no longer need to be informed door by door and ask somebody to take a oral message, they can notice them at any time and everywhere. They can break the occlusion to understand domestic and foreign news and other useful information in the world. Although they work in their field, they still can have a direct dialogue face to face with agricultural experts in the institute through the mobile internet terminal. They can ask questions to the expert and get the advice through the screen. With the development of e-commerce in the rural areas, farmers can timely know agricultural products supply and demand in the fields.

3.2.3 Broaden the employment channel for farmers

In the past, farmers often stick to their fields of agricultural production. Because of low efficiency of traditional agricultural production, the rural health care, children education have become a heavy burden for farmers. Now farmers can find out the demand according to their ability through the mobile internet, they can find way out of original narrow space to have new business or go to the city to find a new job for more money. These changes have sped up the integration process of rural urbanization in china.

3.2.4 Improve the spirit and outlook of farmers

In the past, farmers have a weak legal concept, and lack of consciousness to use the law as weapons to protect their own legal rights.This asymmetry of information make the farmer's legitimate rights easy to be violated. Now, farmers can conveniently obtain the relevant legal knowledge to protect their own rights and interests, they can express their dissatisfaction or expose the problems through the website, micro-blog, weichat etc..In addition, since farmers have acquired new information actively, they have increased their knowledge, strengthened self-confidence and improved the social status gradually.

3.3 Effect on way of thinking of farmers

Way of thinking is the program and method of people's thinking formed of factors in certain cultural background, knowledge structure and habits. In mobile Internet era, rapid and timely dissemination of information, knowledge popularization, information

acquired by passive steering interaction change, have effected the concept and mode of thinking of farmers.

3.3.1 Excite the creativity of farmers to become rich

Farmer's way of thinking are influenced by region, the scope of activities, cultural atmosphere and other factors. Network and terminal of mobile Internet have been spread the external information to every corner of the rural, thus broken the constraints of region,the scope of activities and cultural atmosphere, and extremely triggered the farmers' ability of thinking and imagination. This kind of imagination can help the farmers to break away from the constraints of direct space and real space, and enter the possible and ideal space, then establish the target quickly. It can favor the innovation of knowledge and technology of farmers, so they will create new inspiration and new ways to get rich.

3.3.2 Improve the capacity of farmers to accept education

Mobile internet bring the farmers instant information communication and abundant information resources, make the farmers' understanding of the outside world far beyond what they can directly experience of their living world. So the interest of understanding external world of farmers was greatly stimulated. Acceptance of education of farmers will swing rapidly from passive to active,they have been infected by the surrounding farmers who got the information and became rich. They actively offered to accept knowledge and education, use modern information technology and equipment to link with the outside world as soon as possible. Based on that, under the improvement of basic education facilities, rich information resource of practical production technology, life knowledge and training in rural areas, farmers' ability to accept the education will be improved greatly.

3.3.3 Test the farmers' ability to identify the right things

Large quantities of Agricultural and rural information resources were sent to the farmers through the terminal of mobile Internet. They are information of practical production technology, market and healthy entertainment information etc., in the same time, some of them are information of fraud, superstition, pornography and violence and negative decadent content. The latter will harm the farmers with low education. So it is a test for the farmers to correct the discrimination of things, and will force the farmers gradually to learn how to make a judgment and choice.

3.3.4 Get rid of the superstitious feudal idea of farmers

The countryside is a place with high-rate occurrences of superstitious feudal ideas and rumors. The mobile internet and other advanced means of information dissemination have linked the rural and outside. Farmers gradually get and master more scientific

knowledge, understand that they should consider all kinds of relationships with the things around when they deal with complex things. Thus they can break the shackles of traditional ideas and thinking, open to consider new problems, solve new contradictions and accept new things, gradually they will move away from the idea and the custom of feudal superstition.

4 Suggestions for farmers in mobile internet era

Mobile Internet brings farmers many conveniences, but also raises a series of new problems. In view of this, the author puts forward the following suggestions.

4.1 Using cloud computing and cloud services to integrate and share agricultural and rural production and living information

In China, scattered agricultural production mode determines the agricultural information resources scattered, the cost of collection is high, and it is difficult for integration. At the same time, most of the integration are often for professional data resources from some scientific research institutions. In fact, large number of information kept by rural grassroots technicians, experts and managers and communicated in agricultural production activities can not be integrated and shared. This information plays an important role in the guidance of Agricultural production. As a sharing infrastructure, cloud computing can easily integrate various of information resources. Cloud storage make all types of users access to their own data and others by using a variety of terminals, establish their own information center without worrying about memory and servers. Low cost cloud storage can reduce high data collection costs, broaden the information service breadth, reduces information threshold and improve the information service benefit.

The requirements of information technology ability for terminal user are very low under cloud computing environment. It is what the groups of farmers needed. Farmers can use a variety of terminals to access the cloud, it can be a computer or mobile phone with Internet and browser. Do not need to install a wide variety of applications, do not need to care about data storage location and security of the data, whether it upgraded or not, even without antivirus software and firewall. All this work is finished by cloud computing center, professional cloud team will provide professional services to the user.

Under the cloud computing environment, agricultural information consulting becomes simple (as shown in Fig.1). The farmer put forward request, cloud services platform get the request, decide its types and characteristics, according to different agricultural information service advantage, it will schedule problem automobility and specify one agricultural service organizations to answer user's questions.Cloud service platform can be regarded as black box between the farmers and the agricultural information service institutions, it plays the role of scheduling, allocation of resources and assisting the advisory communication. Due to the adoption of joint service mode, farmers can get solutions soon.
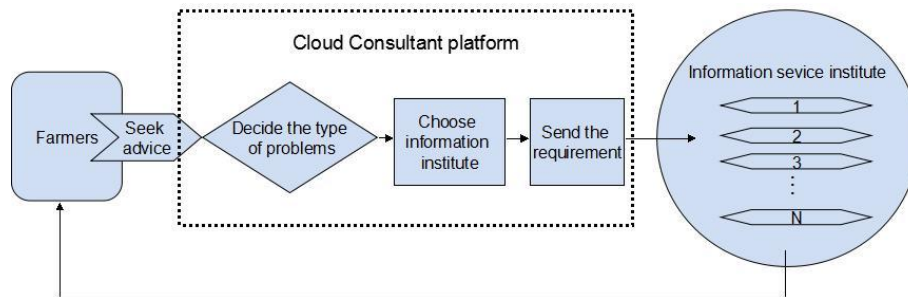
Fig.1 Agricultural information consulting platform under the cloud computing

4.2 Equipping grass-root agricultural technician with 3G terminal to help the farmers to deal with practical problems in agricultural production

Grass-root agri-technique extension related to food security, farmers' income and rural development. In mobile internet era, most of farmers are easy to get information from the internet and communicate with outside. However the mobile internet only solved the hardwares of information acquirement, how to get the useful information, how to identify the information and how to use the information still puzzled the farmers. Abundant information have broaden the knowledge of farmers, but a wide range of knowledge, if can not be combed, is often scattered and inefficient. As for farmers, the important is not to get the information for production activities, that is how to use it. In many countryside area of eastern coastal area, because of the fast economic development, information construction developed faster, the wireless broadband Internet access is not a problem, but the reality is, application level is very low. Since most of them are low educated, so they really need the grass-root agricultural technicians to help them.

Ministry of Agriculture, P.R.China have focused on enhancing the problem-solving ability of grass-root technicians by trainings and helping farmers solving the problem of agricultural production on the spot many years ago. However, limitation of timeliness and specificity of the information always puzzled the technicians and farmers. So it is necessary to equip the grass-root agricultural technician with 3G terminal for timely problem-solving of agricultural production for the farmers.

Through 3G terminal, technicians can educate farmers information awareness, enhance their ability to use information. Then they can educate the farmers about the new agricultural technology and ask for help from related institute and university by video conference system or submit the questions while they went to help the farmers. Moreover, technicians can be managed in a high efficiency by problem-solving record and GPS location. So the officers of agricultural management department can motivate them in a measurable way.

Now Chinese Academy of Agricultural Sciences have started to establish an Agri-technique Extension Platform System to provide the service for agricultural technicians with 3G terminal installed Android system, that will allow technician to get timely and detail problem-solving information or guidance to help the farmers(as shown in Fig 2).
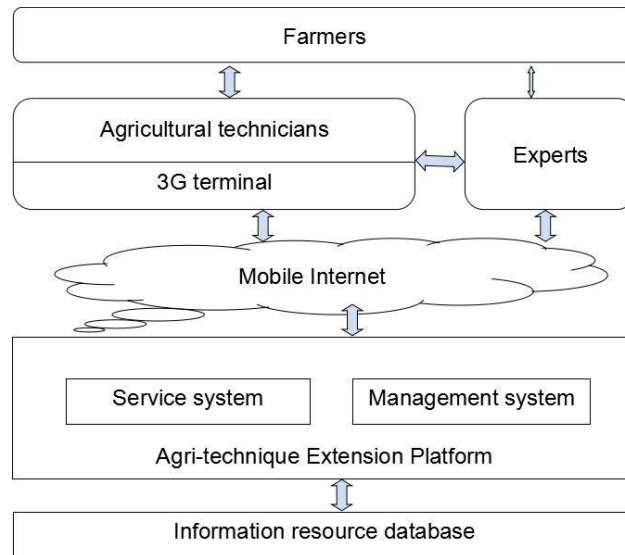
Fig. 2 Agricultural Extension Platform System

4.3 Using SNS to help farmers setting up mobile Internet social relationships for information sharing

In recent years, social networking (Social Networking Services, SNS) is developing rapidly in China and abroad, brings an Internet revolution, some comments regarded that as the signs of Web3.0 times, and it bring about an all-round experience for Internet users. The development of SNS based on the "six degrees of separation" theory and the "150 law". Six degrees of separation (Six Degrees) refers to a person with a stranger by interval not more than 6 person. SNS has its unique development space in the complex human society.

The SNS site, in foreign countries, it was represented by Myspace, Twitter and Facebook etc.. In China, SNS also develops rapidly. Renren, Kaixin, and 51.com makes SNS particularly conspicuous in China's Internet market. At the same time, Tencent, Sina, Sohu and other companies have also introduced SNS development strategy. With the advantages of true user information, clear relationship, content diversity, easy and convenient resource management, and combined with mobile communication technology, SNS has been widely praised by China's Internet users.

SNS with its unique attraction and high user viscosity, can greatly improve the farmer online interest, and further enhance its Internet operation ability, so that farmers can take the initiative to learn new technology, new method. Therefore in the mobile Internet era, using SNS to help farmers to set up mobile Internet social relationships, it will convenient for farmers to exchange and share the information of agricultural production, rural life, purchase and sale of agricultural products with others outside.

It is worthwhile to note that agricultural SNS is different from the commercial SNS, it must consider the actual needs of agriculture and farmers in the initial construction. In

addition to rely on agricultural technicians, big farmers, experts exchange information, we also should rely on the existing scientific research resources to establish useful agricultural knowledge database. Using open API, the existing agricultural service concepts and technologies are integrated in the SNS platform, that can promote the agricultural SNS service capability and increase the users and resources, and mining the knowledge generated by users. With the rapidly growing of agriculture SNS user, the docking of supply and demand of agricultural products can bring huge profits for the website, such as the Taobao, 58 city and so on, that also can solve the practical problem of agricultural products sales for farmers.

Acknowledgment

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