Development and Preliminary Application of Multi-channel Agricultural Science and Technology Consulting Service U Disk

To cite this article: W S Yu et al 2017 IOP Conf. Ser.: Earth Environ. Sci. 100 012119

View the article online for updates and enhancements.

Related content
- Replacing HDDs with Solid-State Flash Disks in PXIbus-Based Systems
  Z W Zhao and L Zeng
- Research on the development and preliminary application of Beijing agricultural sci-tech service hotline WebApp in agricultural consulting services
  Weishui Yu, Changshou Luo, Yaming Zheng et al.
- A GENERAL BAYESIAN IMAGE RECONSTRUCTION ALGORITHM WITH ENTROPY PRIOR: PRELIMINARY APPLICATION TO HST DATA
  Jorge Nunez and Jorge Llacer
Development and Preliminary Application of Multi-channel Agricultural Science and Technology Consulting Service U Disk

W S Yu, C S Luo*, Q F Wei, Y M Zheng and C Z Cao
Institute of Agricultural Information and Economics, Beijing Academy of Agriculture and Forestry Sciences, No.9, Shuguang Huayuan Road, Beijing, China
Email: waterhho@163.com

Abstract. To deal with the "last kilometer" problem during the agricultural science and technology information service, the USB flash disk “Zixuntong”, which integrated five major consulting channels, i.e., telephone consultation, mutual video, message consultation, online customer service and QQ group was developed on the bases of capital experts and date resources. Since the products have the computer and telephone USB interface and are combined with localized information resources, users can obtain useful information on any terminal without the restriction of network. Meanwhile, the cartoon appearance make it friendly and attractive to people. The USB flash disk was used to provide agricultural expert consulting services and obtained a good preliminary application achievement. Finally, we concluded the creative application of USB flash disk in agricultural consulting services and prospected the future development direction of agricultural mobile consultation.

1. Introduction
The development of modern agriculture requires the support of science and technology, while the application of new agricultural science and technology needs timely and efficient service platform. As the agricultural production process is complex, the agricultural technology service directly from the expert has the superiority to other methods. With the popularization of Internet and continuous improvement of agricultural productivity level, the traditional science and technology information service can not satisfy the users’ diversified, personalized and timely demands of getting agriculture information[1]. Therefore, to provide integrated science and technology information, it needs to develop new service network platform by App or customized IT products based on the modern communication and network technology.

1.1. Status of Present Countryside Agriculture Information Services
According to "A Report on the Development of Rural Internet in 2015 [2]" released by China Internet Network Information Center, by December 2015, the rural internet coverage ratio is only 31.6%, about 195 million rural internet users, having great room to be promoted. What’s more, the main way to get information in rural areas is mobile phone, followed by computer [3]. It is necessary to provide the agricultural science and technology information service through IT products for the farmers, as 68.4% of the rural people obtained information relatively limited and inaccessible.

At present, there were many ways to get the agriculture information, such as hotline, mobile phone App, WeChat Public Platform and QQ group, etc. These consulting service channels need the users to
obtain the information under the circumstance of the network except the hotline, which can solve the farmers’ consulting needs to some extents. The farmers in network underdeveloped areas have difficulty to get the agricultural information.

1.2. Advantages of U disk to Provide Agricultural Science and Technology Information Services

The “Zixuntong” U disk can provide multi-channel agricultural science and technology consulting services for users, especially the people in network restricted area. The product has the following advantages: firstly, large number of agricultural technology, video, courseware can be localized on the IT products, making users access agricultural information services without the restriction of network conditions. Secondly, users can use the U disk to get agricultural science information both on computer and mobile phone anytime and anywhere if they need. Thirdly, users can upgrade and update the product to get the latest agricultural technical information in the condition of network. In conclusion, the U disk offers a new method to meet the requirements of obtaining new agricultural varieties and techniques.

1.3. The Necessity of Developing Multi-channel Agricultural Science and Technology Consulting Service U disk

Rely on the rich scientific and technological resources in Beijing, Beijing Agricultural Science and Technology Information Service Center implement the “Internet+”agricultural science and technology information consulting service system and set up a service experts team which has more than one hundred rich theoretical and practical experience agricultural specialists. Many consultation methods, such as voice, video, website, APP, etc, were developed based on modern information technology to offer agricultural science and technology information services for farmers. At present, the service covered all the districts in the suburbs of Beijing and more than 30 provinces and autonomous regions nationwide, gaining significant economic benefits and establishing the “Jingke Huinong” service brand of agricultural science and technology consultation [4]. In order to give full play to advantages of Beijing experts and bring the advanced agricultural technology to all over the country, we designed and developed the multi-channel agricultural technology consulting service product, which can expand service channels for the center and improve the service brand influence. The multi-channel agricultural science and technology information service U disk can offer useful information effectively and reduce the cost of consulting information, which can enhance brand image of the center and improve the social influence.

2. Platform Development

Combined with the requirement investigations, the multi-channel agricultural science and technology information service U disk was developed following the principles of more convenient for customers to use, more efficient for experts to response and easier to carry. The product was developed mainly to solve two problems. One is how to provide more convenient services for agricultural technicians and farmers and enhance the brand image of “Jingke Huinong” via the IT product. The other one is how to offer the agricultural information for the remote users without the limit of the network. In order to solve the above two problems, we designed and developed the “Zixuntong” product based on HTML and JAVA technology.

The consulting system on the U disk includes four sections, i.e., intelligent query section, consultation question sets section, expert introduction section and multi-channel consulting section. For intelligent query section, we put forward the agricultural knowledge map association question and answer method, achieving the process of moving the mouse automatically get technical questions and answers. This function based on the "theme - attribute - instance - address" quartet's consultation theme tree, implemented by the technology of word association, knowledge navigation, semantic retrieval. The consultation question sets section collects all counseling questions & answers together. Users can browse and refer to questions & answers according to the agricultural field, which can expand the user’s knowledge of the relevant agriculture areas. What’s more, the questions can present
in descending order of clicks, so the user can obtained the latest hotspot of agricultural technology. User can get the detail introduction of the expert, including the specialty, achievements and duty time in the expert introduction section, by which they can find relevant expert of their needs and consult the expert timely. The multi-channel consulting section provide users five major consulting channel, i.e., telephone, video, message, QQ group and reservation. What's more, it also provides quick entrance to the Beijing Agricultural Hotline APP and WeChat Public Platform of 12396 Beijing new rural science and technology service hotline, so that users can choose the way they like to consult agricultural issues. The system can be updated in the condition of network by a function button to get the latest hotspots of agricultural technology.

3. Preliminary Promotion of the "Zixuntong" Product
The promotion model of "online and offline" was used to enhance the advisory service influence of multi-channel agricultural science and technology consulting service U disk, so as to earn more loyal users. Online promotion: mainly through the major consulting channel of Beijing Agricultural Science and Technology Information Service Center, including WeChat Public Platform, micro blog, QQ group, website and other means to introduce the advantages and instruction of the multi-channel consulting U disk product for users, in order to obtain more users and expand the influence of the center. Offline promotion was accomplished by the Beijing Agricultural Science and Technology Information Service Center's countryside training, special presentations, science and technology weeks, so that users can understand and experience the U disk products.

The combination of online and offline of the preliminary promotion get a good effect and the product were widely accepted by farmers from all districts and counties in Beijing. The proportion of consultation problems in each district is shown in Fig.1, Daxing district accounts for the most(16.38%), followed by Tongzhou(11.97%). The composition of user groups were individual peasants, organization members, agricultural technicians, citizens, employees, and researchers, the proportions is shown in Fig.2, most of them were individual peasants, accounting for 55% of the total. The analysis of users' consulted issues is shown in Fig.3, most users care about agricultural technology and policy, in addition, information about achieving prosperity and market information also accounted for a certain percentage.
### Figure 1. The proportion of consultation problems in each district

| District            | Percentage |
|---------------------|------------|
| Yanqing District    | 8.73%      |
| Miyun District      | 8.55%      |
| Huairou District    | 2.61%      |
| Pinggu District     | 7.38%      |
| Changping District  | 11.79%     |
| Shunyi District     | 10.98%     |
| Tongzhou District   | 11.97%     |
| Daxing District     | 16.38%     |
| Fangshan District   | 7.92%      |
| Mentougou District  | 0.90%      |
| Shijingshan District| 0.36%      |
| Fengtai District    | 1.53%      |
| Haidian District    | 8.91%      |
| Chaoyang District   | 1.35%      |
| Xicheng District    | 0.18%      |
| Dongcheng District  | 0.45%      |

### Figure 2. The individual attributes of users

- Individual peasants: 55%
- Organization members: 4%
- Agricultural technicians: 4%
- Citizens: 2%
- Administrative staffs: 2%
- Employees: 5%
- Researchers: 11%
- Others: 19%

---

4
4. Innovations and Outlook
The U disk can provide multi-channel agricultural science and technology consulting services for users both on the computer and mobile phone, meeting the personalized demand from farmers of obtaining new agricultural varieties and technology. What's more, due to the localized resources on the U disk, people, especially the people in network restricted area, can get agricultural service from the capital experts. The cartoon appearance combined with the intelligent navigation make it simple for people to use. Disadvantages: due to the security of the mobile phone system restriction, the U disks system should be started manual on the mobile phone, which can cause some inconvenience to the user.

With the continuous development of mobile internet technology, the agricultural consulting service will undergo new changes. First and foremost, agricultural consulting service will be more diversified. It will not only provide agricultural technical information, but also offer the information of product display and sale, technical recommendations, remote diagnosis of agricultural diseases, agrometeorology disaster forewarning [5], providing a convenient way to promote scientific research to practical application. Secondly, the agricultural consulting service will become increasingly intelligent [6]. With the rapid development of science and technology, agricultural consulting service will be more intelligent and automated, and develop towards self service modules with intelligent voice recognition function. The intelligent hardware products of agricultural science and technology consultation service will also be launched. Last but not least, the agricultural consulting service will integrate the advantages of live technologies, which can display the products, online survey, dialogue interview, and online training simultaneously, providing more convenient and efficient scientific and technological information services [7].

5. Conclusions
The multi-channel agricultural science and technology consulting service U disk offer an effective and convenient way for farmer to get the latest varieties and techniques. It will save the cost of getting agricultural science and technology information service, promote the achievements of agricultural scientific and technological into the ground if the U disk was applied in wide range. It is of great significance to solve the “last kilometre” problem of consulting agricultural science and technology.

Acknowledgments
The work was supported by the young scientist fund of BAAFS: Research on agricultural scientific technical online counseling system based on the knowledge map (NO.QNJ201534), the Beijing social science foundation(16JYC026): Innovation research of rural distance education service supply mode in Beijing base on “Internet +”, the innovation fund of BAAFS: Agricultural water-saving technology training and counseling service demonstration project (NO.KJCX20151409), the fund for agriculture
of Beijing municipal commission of rural affair: The application of App and "zixuntong" products in the management and service of general agricultural technicians.

References

[1] Wang Z, Study on construction of Anhui agricultural science and technology information service platform [D], Anhui University of Finance and Economics, 2014.

[2] China Internet Network Information Center 2015, A Report on the Development of Rural Internet in 2015.

[3] China Internet Network Information Center 2016, The 39th Statistics Report on Internet Development in China.

[4] Li Z, Luo C, Zhang J 2015. Research on the Development and Preliminary Application of 12396 New Rural Sci-Tech Service Hotline We Chat Public Platform. Open Automation & Control Systems Journal, 6, pp. 839-843.

[5] Zhang H, 2014 Prospect of APP Application of Agricultural Information Service Platform Based on Android Intelligent Mobile Phone, Heilongjiang Agricultural Sciences, 8, pp. 126-128.

[6] Xu S, Wang D, Li D, Gao L, 2017 Progress and Outlook of China's "Internet+" Modern Agriculture[J], Agriculture Network Information, 1, pp 10-17.

[7] Bai Y, 2014 Application of Traditional Media to New Media Integration on Agricultural Information Service[J], Agriculture Network Information, 11, pp 55-57.