

U Nong Jia Qin Tong System —The Agricultural Knowledge System Based on U Disk

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Abstract. The rural areas in China have a relatively low Internet coverage, as a result of which the peasants are ill-informed and short of information products that assist the popularization of agricultural technology. The commercialization of scientific achievements is not effective in the rural areas. To solve these problems, the paper puts forward a new mode of spreading agricultural information to popularize advanced agricultural technology and train the peasants, with U disk as a carrier. The poultry raising IT-based product based on U disk-*U Nong Jia Qin Tong System* is portable with mass storage, containing all the advanced technology of the entire process of poultry raising and can upgrade automatically, which is suitable for the status quo of the development of Chinese rural areas, and has effectively solved the problems peasants are faced with in knowledge acquisition and thus has a promising prospect of application.

Introduction

Poultry raising is developing rapidly in China with increasing demands for meat, eggs and milk as a result of improved living standards. China tops the world in the scale and capacity of poultry raising which has now become an important way for Chinese peasants to get rich^[1,2]. In the era of knowledge economy, it has become a general consensus to raise output and immunization prevention by using advanced science and technology. China's poultry raising market is a large one composed of a great number of small-scale families engaged in poultry raising^[2,3]. These families are in urgent need of advanced technological information to guide them in their production. However, the rural areas have a low Internet coverage and the peasants here are ill-informed. Therefore agricultural IT products suitable for rural areas are particularly needed.

In order to make up for the poor Internet infrastructure in rural areas, and channel the large amount of latest information on poultry raising in the city to the rural areas for the families engaged in poultry raising, this program explores a new information spreading mechanism using modern information technology and developed *U Nong Jia Qin Tong System* suitable for rural areas which features low cost and easy operation. The product reorganizes expert knowledge into poultry knowledge base, by virtue of data compression and storage techniques, stores related knowledge on U disk and imparts to the peasants, thus helping scientific research personnel spread their new achievements in a wider scope timely.

Reasons for choosing U disk as the carrier of spreading agricultural technological information

Currently, agricultural information service model relies largely on TV sets, computers and cellphones. According to a survey by Nielsen, the smartphone penetration was 62% in China in 2014, with a huge gap between cities and rural areas^[4]. As the penetration rate in rural areas was only 32%, and most of the peasants engaged in agriculture are above 50 which means an even lower penetration of smartphones, smartphones are not an appropriate means for spreading agricultural technological information in rural areas. Data shows that the Internet penetration was 30.1% in rural areas by June

2015^[5]. Most of the livestock farms are located in remote areas, which means it is hard for peasants engaged in poultry raising to learn related knowledge through the Internet.

U Nong Jia Qin Tong System based on U disk, a portable agricultural information product, was thus developed complying with the real situation in rural areas, creating a new channel for spreading knowledge on poultry raising in rural areas. By virtue of U disk, *U Nong Jia Qin Tong System* spreads knowledge related to poultry industry in accordance with the current status quo of the computerization in China's rural areas, and promotes the quick popularization and commercialization of scientific research achievements. U disk as a channel to spread knowledge has the following advantages: U disk is small and convenient to carry; the cost of buying a U disk is not high and the price of *U Nong Jia Qin Tong System* is acceptable to peasants; peasants, without the restriction of computer and the Internet, can search and learn knowledge on poultry raising at any computer, which solved the actual problems they encounter in poultry raising. Therefore U disk was chosen as the medium for spreading agricultural scientific and technological knowledge.

Building Poultry Knowledge Base Based on U Disk

Relying on the large amount of data accumulated in The Beijing Agricultural Digital Information Resource Center and the powerful expert team, based on the knowledge required for poultry raising and the actual demand of families engaged in poultry raising, poultry raising knowledge base was built on the basis of the original poultry raising database, with further sorting, compacting and pooling of resources, which includes eight poultry raising databases: poultry breed database, poultry raising technique database, poultry disease control and prevention database, special poultry breed database, special poultry raising technique database, special poultry disease prevention and control database, poultry raising policies and regulations database and poultry raising standard database. All the resources in the database came from first-hand materials from experts and professional literature. One example is Beijing local breed Beijing Fatty Chicken, All the technical data are from famous You Chicken breeding experts, All the data in the knowledge base have been reviewed by experts so as to ensure the accuracy and practicality of the data.

System Architecture

U Nong Jia Jin Tong System is an agricultural computerized terminal product developed with C++, XHTML language and ACCESS database technology. As shown in Fig 1, a U disk-based poultry knowledge database was created by integrating databases of poultry breed, raising technique, disease prevention, policies and regulations and standards, and the *U Nong Jia Jin Tong System* was developed by further organizing and connecting relevant knowledge. The system has the function of browsing, natural language retrieval, expert consultation and on-line remote update, and offers services on poultry raising technique to poultry raising families by the medium of U disk, which makes it possible for peasants to master the latest and comprehensive poultry breeding technology easily as if there is an expert always around them.

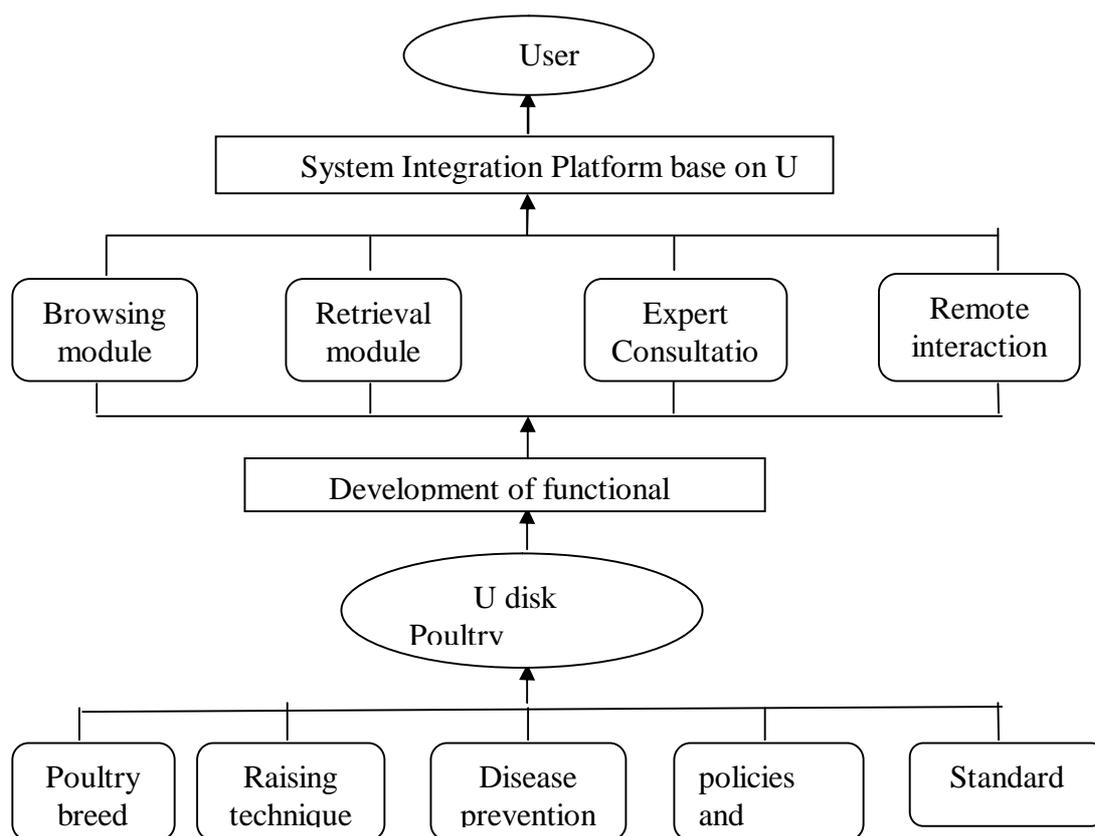


Fig.1. The framework of *U Nong Jia Qin Tong System*

System Functions

The development of *U Nong Jia Qin Tong System* based on U disk poultry knowledge base was conducted following the principles of “friendly interface, simple operation”. The computer will automatically enter the *U Nong Jia Qin Tong System* when the U disk is inserted into the computer. The system is divided into four modules according to function: multi-dimensional knowledge navigation, natural language retrieval, expert consultation and remote online update.

Multi-dimensional Knowledge Navigation

Poultry raising knowledge is presented to the user through knowledge classification navigation in a scientific, systematic and clearly way, on the basis of poultry raising knowledge base, with the aid of modern information technology means such as data compression and information organization. Knowledge classification is a multi-dimensional navigation. The first is classified according to poultry species such as chicken, duck, goose, pigeon, quail and special poultry. The second is classified according to breeding process, including species, breeding technique, disease prevention and control, regulations and standards, and each type of knowledge is subdivided according to knowledge point. Multi-dimensional knowledge navigation is a user-friendly guide that can guide users in locating the required knowledge from multiple dimensions, in a convenient and quick way. In addition, the system also provides a wealth of high-definition pictures and videos, which makes the information more direct and easy to understand.

Natural Language Retrieval

Peasants often use vernaculars while searching desired information because they are unable to use formal words. Due to this condition, the natural language retrieval function is required for the retrieval

system and for this function, intelligent segmentation technique and semantic matching technique are used in this module. The module supports keyword search and whole sentence retrieval. The model built a corpus that complies with the characteristics of peasants, as a result of which the peasants can use their own language to describe information demand and the system recommends knowledge to the users and helps them to quickly find the information they need through words processing, lexical meaning extension and semantic association.

Expert Consultation

The system contains a built-in expert consulting system of Beijing Academy of Agriculture and Forestry Sciences, which is an effective complement to the knowledge base. When the knowledge base does not contain the information peasants need and thus can't solve the problem in actual production, the peasants can consult with the expert face to face through the built-in online consultation and video consultation.

Long-distance Online Update

By virtue of the Internet and U disk read and write functions, *U Nong Jia Qin Tong System* realizes online update of the knowledge base, offering the latest technology information to peasants which guarantees the timeliness of information. First of all, an online updating program was developed and built in the *U Nong Jia Qin Tong system*. Second, store the compressed and packaged new and updated data on the local server, then connect the user with remote end through the Internet for remote update, using point-to-point communication technology.

Conclusions

U Nong Jia Qin Tong system has been developed and the massive popularization and application are now being conducted in the suburbs of Beijing. The product enjoys a great popularity among peasants for the large amount of agricultural technology knowledge it contains and its characteristics of easy to use. By storing knowledge in a U disk, *U Nong Jia Qin Tong* imparts new technology to peasants in a way that they could accept easily, creating a new mode for the popularization of agri-technological achievements, which will play an important role in the popularization of agri-technology and peasant training and is conducive to improving peasants' scientific quality and the popularization of advanced scientific and technological achievements. *U Nong Jia Qin Tong System* will be popularized in Beijing, Tianjin and Hebei in the future.

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References

- [1] Jiangzhong Du: South China Agriculture ,Vol.9, No.16,(2015), p.80-81.
- [2] Guosheng han,Pin Zhao: Agriculture of Henan ,2012. (3), p.18-19.
- [3] Zhengdong Yuan: China Poultry, Vol.33, No.3,(2011), p.1-3.
- [4] Information on <http://www.iyunying.org/seo/sjfx/25159.html>.
- [5] China internet network information center(CNNIC): The 36th Statistical report on internet development in china(2015).