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A Case Study of Construction of Special Database on Urban Agriculture in Library of Beijing University of Agriculture

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Abstract With the development of urban agriculture and digital library, the theoretical research and exploitation of special database on urban agriculture has become an inevitable trend. On the basis of analyzing the advantages of the special database on urban agriculture constructed by the library of Beijing University of Agriculture, the author has analyzed the status and the problems of the special database on urban agriculture developed by Beijing University of Agriculture and proposed the development path of special database on urban agriculture.

Key words Urban agriculture, Special database, Analysis

With the rapid development of the information society that is specialized in professions, cross-blended with multiple subjects and exploded with knowledge, many universities have launched the theoretical research and practice for the construction of the special database through the computer management and network information technology in order to further perfect the collection and improve the reader service level. It has been a key and hot point for the library work and practice research over the recent decade. Relying on the reserved information resources, the special database of university library includes the books, electronic resources, video and audio data, information not published by the university as well as the public network information resources that are collected, analyzed, classified, evaluated and organized according to the information requirements of readers and the features and laws of special subject or topic. Then, the database is digitalized according to certain standards and specifications and arranged in a certain format. Finally, the information resources stored are collected in the form of database. The urban agricultural universities shall survey, analyze, collect, classify and digitalize the documental information according to their research directions and tasks to save the urban agricultural literature at home and abroad and establish the special database on urban agriculture, providing the readers with information of scientific reference value.

1 Feasibility Research for the Development of Special Database on Urban Agriculture

The construction of special database on urban agriculture shall take the agricultural development features of Beijing, the special subject development of the university, the requirements of special built-in database and other relating factors into account. Before deciding to establish the database, feasibility analysis shall be

performed and adequate research preparation work shall be made.

1.1 Combination of the clear regional positioning for urban agriculture in Beijing and higher education development goals

In 2005, Beijing proposed the development of "Urban Modern Agriculture" on the basis of serving Beijing agriculture according to the actual situation and city case. JZNF [2005] document No. 6 has defined the Urban Modern Agriculture in Beijing as "The urban modern agriculture refers to the large-scale modern agriculture that has fused the productivity, lifestyle and ecology natures through modern measures according to urban radiation and requirements". This concept has reflected the regionalism of the capital, and has a remarkable effect on improving the urban politics, culture life, education and entertainment of Beijing.

The development of urban agriculture in Beijing requires the assistance, support and regurgitation-feeding of urban agricultural culture. Besides, the development of urban modern agriculture plays a very important role in the modernization process of urban agriculture. During the "12th Five-Year Plan" period, many universities have reformed the traditional education concept, applied connotative development and carried out the open education concept in the management mode, education model, education and teaching resources, construction of teaching troop and research mode *etc.* The boundaries of the main activities and resources have extended to the society to obtain more social resources, win more development opportunities and achieve better and faster development. For the construction of urban agricultural culture, the library of Beijing University of Agriculture has unique advantages. Since 2007, Beijing University of Agriculture is the first university that carries out the borrowing and reading with RFID technology among various universities in Beijing. Upon completion of the new library of Beijing University of Agriculture in September, 2011, the library of Beijing University of Agriculture and the urban agricultural data center were also founded formally to collect, process, classify and digitalize the special literature on urban agriculture. The school leaders attach great importance to the construction of urban agriculture and have incorporated this work into the "12th

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Five-Year Plan" and key emphasis in work of Beijing University of Agriculture. The university will undertake its social responsibilities in school-enterprise cooperation, complementary advantages, resource sharing, agricultural technology innovation as well as the economic and social development of the service area.

1.2 Historical accumulation of professional literature resources in library of Beijing University of Agriculture Beijing University of Agriculture has a long history in the construction of professional literature resources in the library. And the resources on agriculture-related subjects has formed unique systems and features through many years of construction, ranking the forefront of the country in Production – Study – Research cooperation and serving the rural area in Beijing suburbs with expert team. After years of accumulation and network construction, the literature resources in the library have form distinctive agricultural features covering the collection systems on biology, engineering, economics, management, law, liberal arts and science, including 640,000 volumes of paper documents, 29 databases in Chinese and foreign languages as well as 210,000 kinds of electronic books. These above has forms a literature resources collection with complete range of articles, high quality and good historical succession, serving the readership of Beijing University of Agriculture as well as the agriculture of Beijing and the whole country; in addition to the subjects of biology, engineering, economics, management, law, liberal arts and science *etc.* relating to agriculture theory and practice research, the university also owns Beijing urban agriculture research institute and a batch of academic teams and experts with reasonable knowledge structure, high quality and undertaking many national and provincial scientific research projects. Such as professor Wang Younian (a famous expert in this field, leader in key disciplinary fields on fruit tree in universities of Beijing, and the organizer of Beijing valley economy) and his research team; and the demonstration garden of urban agricultural institute in Machikou Town of Changping is a typical example of school-enterprise cooperation. Therefore, constructing a subject database on urban agriculture as a platform for information transfer and communication and selecting senior resources to establish a library can play its role in "coming from the society and servicing the society", preventing it from being overwhelmed with massive amounts of information.

2 Status and Problems on the Development of Special Resources on Urban Agriculture

2.1 Disorderly distribution of urban agricultural resources with insufficient integrating effort The special tasks of university library include collecting various kinds of document literature, performing classification and management with scientific method, evaluating the resource optimization and information service of the library scientifically, establishing a harmonious relationship of mutual benefit with the readers, educating and developing more readers and achieving common development finally. But as the library work has been bounded by the collection-oriented concept for a

long time, the library work still remains in the one-off literature service stage with low secondary processing and tertiary processing level and low knowledge content; the professional features of urban agricultural resource collection are less prominent with the resources scattered in the database in library, stack room and even the reference room in the other departments of the university. Practice shows that the utilization effect of information resources without favorable organization and revelation will be less than satisfactory, even though there are abundant resources. The readers will have to spend much valuable time and effort finding the required urban agricultural information. For example, there are 29 databases and 640,000 volumes of paper documents in Beijing University of Agriculture, but the literature can hardly take effect for lack of classification and insufficient built-in databases, motley collection of resources and lack of features and advantages.

2.2 There are various types and large quantity of urban agricultural resources with difficulty in distinguishing the quality Urban agriculture is not only a universal concept, but also applicable to the market needs of large cities and reflects the features of regional economy; urban agriculture is not only a general concept, but also refers to a form of agriculture with advanced and diversified business form, including the ecological agriculture, leisure agriculture, sightseeing agriculture, tourism agriculture, agriculture for foreign exchanges, creative agriculture and digital agriculture. As there is no unified understanding on the definition of the urban agriculture in China and the standard for information source to collect the literature is not strict enough, the precision ratio and recall ratio of information capturing will be affected. Sometimes it will be needed to choose from and balance between the two. For example on April 21, 2012, searching "urban agriculture" in the information source CNKI will obtain 3585 related records including some inferior information similar to "rural area in suburb of Chengdu" and "Huadu agriculture" to make up a number without active work. This has burdened the information analyzing, screening and obtaining greatly.

2.3 Technology is the bottleneck for document resource digitization The resource object for library digitization of Beijing University of Agriculture not only includes the paper documents and electronic documents; but also includes the published literature and the unpublished grey literature. There is a large amount of information resources with different structures and standards. But the library hasn't introduced the advanced, normalized and open digital standard and technology yet, which is difficult to ensure the quality of the special literature database. Thus, the database won't be able to fit into the broad environment with sharing literature information resources, achieve the compatibility and sharing with other kinds of databases and bring its social benefit in full play on a larger scale.

3 Development Strategies for Special Resource Database on Urban Agriculture

According to the reader demand principle, special service princi-

ple, conservation and preservation principle, resource superiority principle and improving collection principle, the information source shall be classified on the basis of its origin, carrier, rating and level at the early stage of library construction. And different sections shall be set for revelation, as shown in Fig. 1. Besides, formal preservation and sharing mechanism shall be built.

3.1 Selecting and exploring resources according to the priority and level of content On the basis of tracking, understanding and collecting the publishing and issuing trends of the urban agriculture research literature at home and abroad, relevant urban agriculture literature are explored, screened, classified, evaluated and set for classification search to form the multi-layer structure dominated by Beijing urban agricultural resources of the university. According to this, the resources relating to Beijing urban agriculture are collected and preserved in particular, and the general literature shall be collected accordingly; obtaining all the document literature that is most valuable and most special to enrich the content of the database; focusing on the collection and preservation of resources relating to Beijing urban agriculture.

(1) Prioritizing the construction of special database in cooperation with other organizations of the university relying on the abundant collection resources of the library of Beijing University of Agriculture. The libraries of many universities have established the special database in cooperation with the other organizations of the university, for example, Beijing University has constructed Beijing Historical Geography Database in cooperation with the Historical Geography Institute of Beijing University, Tsinghua University Library has constructed the Database for High-quality Works of Students in cooperation with the Office Of Academic Affairs and the College of Business Administration, library of Nankai University has constructed the Innovation Program Database in cooperation with the Office Of Academic Affairs and Renmin University of China has constructed the Teaching Achievement Database and many other databases along with the Research Department and the Archives. As a result, on the basis of the special information resources (paper and electronic carriers) collected and the experience of the other libraries, the library of Beijing University of Agriculture has realized digitization of traditional literature cooperating with Beijing urban agriculture research institute, Office of Academic Affairs and Research Department to collect and classify the existing papers, monographs, research reports and technology projects with uniqueness, timeliness and research value relating to the special database through the technical means including recording, scanning, digital camera shooting, microform, optical character recognition, audio and video collection, compression and format conversion, speech recognition and artificial intelligence *etc.*

(2) Collecting and preserving the literature resources relating to Beijing urban agriculture particularly, and collecting and preserving the general urban agricultural literature resources in an appropriate way. The former mainly involves the earliest origin about the urban agriculture at home and abroad as well as the research experts on urban agriculture and their research achieve-

ments, which can reflect the historical origin of urban agriculture and its research to the best. For example; The urban agriculture was first created and put into practice by Japanese in the 1940s. The American scholars studied this concept and promoted it to the surrounding area of large cities all over the world; the definition of urban agriculture was originally proposed by Toshiro Shiro in the Economic Geography of Agriculture; YU Jusheng, one of the earliest research experts on urban agriculture in China. The latter mainly includes the works and papers of most scholars in China studying the urban agriculture.

These useful information resources are mainly obtained through the electronic full-text database bought by the library and the network. The electronic full-text database bought by the library can be screened to download, process, reconstruct and replenish the content relating to the database that have been built into the special database; for network information resources, the information on relevant content of the database will be explored and screened through the internet. After that, the information will be processed and classified in order to become the useful information resources for the construction of special database. In this way, the plentiful information resource stream in the network will be transformed to part of the library information resources in the form of restructuring to bear the features of stability and continuity. Besides, the information can be provided to the readers continuously and repeatedly.

3.2 Setting up a special database section to reveal resources

On the uniform search platform of special database on urban agriculture, the resources relating to all kinds of carriers and content are classified and added to the respective sections.

3.2.1 Setting up the "Beijing urban agriculture" section. On the basis of the agriculture foundation, geomorphology features and population distribution features in Beijing, this section reflects the regional characteristics, origin of concept as well as the function development and improvement of the urban agriculture and embodies the improvement and expansion of functions of the library of Beijing University of Agriculture including serving Beijing and serving the society.

3.2.2 Setting up the "Library of Beijing University of Agriculture". The "Library of Beijing University of Agriculture" section includes three items: the core database featured with works of experts in the university and embodied by urban agricultural subject characteristics, including the works, papers and the excellent study material of the teachers in the university as well as the content on "Serving three agricultures" relating to the experts of the university. This database is the combination of technicality and sociality for the special database on urban agriculture in the library of Beijing University of Agriculture; grey literature that reflects the development frontier and development tendency of urban agriculture, mainly including the resources for teaching, excellent master's thesis as well as the teaching and research achievements of the university; the scientific reports, meetings, exhibition materials (project initiating report, final report, collection of scien-

tific achievements, evaluation and patent application documents) and papers *etc.* summarize the actual records for the progress of the research projects and the research achievements systematically. These projects are mostly the major projects on advanced subjects with specific and professional content. The data is accurate and reliable with great value of information; the research report and internal data reflects the dynamic progress and development condition of the urban agriculture in a time-efficient manner, which is of great reference value for the teaching and scientific research staff.

3.2.3 Setting up the "Historical origin" section. This section reflects the historical origin of urban agriculture mainly including the monographs and papers of urban agricultural specialist at home and abroad.

3.2.4 Setting up the "Internet resources" section. Some websites have the advantages of broad range, no limit and openness, which enable the library of Beijing University of Agriculture to capture the information on relevant websites at any time through the data aggregation system. However, as the machine cannot determine and classify the relevance of the information required by the database automatically, relevant personnel need to perform further analysis, indexing and classification for the data captured and save it into the structured database. Therefore, at the initial development phase of the special on urban a agriculture, the "Internet resources" section can be set up in the database to provide a virtual link and advice the users to access relevant information on the website when the quantity and qualification of the information processing personnel in the library of Beijing University of Agriculture fail to meet the above requirements.

Besides, in addition to the science researchers and specialized persons with the intention of finding professional resources, the users of the special database on urban agriculture also include the farmers and college students who understand the agricultural universal knowledge and technical methods. In order to meet the retrieval needs of the readers at this level, special subjects can be set for literature that is widely needed and special readers are most interested in (for example, village official and farmer training *etc.*) to provide systematic and centralized display.

3.3 Quality control and management of special database

3.3.1 Strengthening union and cooperation with university libraries in Beijing. Digital library is the development direction of future library, and the special database is an important part of the digital library. As a result, it is needed to strengthen the alignment and cooperation with university libraries in Beijing (especially library union of digital libraries in the universities of Beijing) to establish a common database management center for universities and colleges. The library members come to an agreement and cooperate with each other under the unified guidance command, and digitalize the exclusive resources to realize resource sharing among all universities and colleges through the unified platform and database constructing standard. Among the digital library platforms of local universities, the platform construction for digital library center in

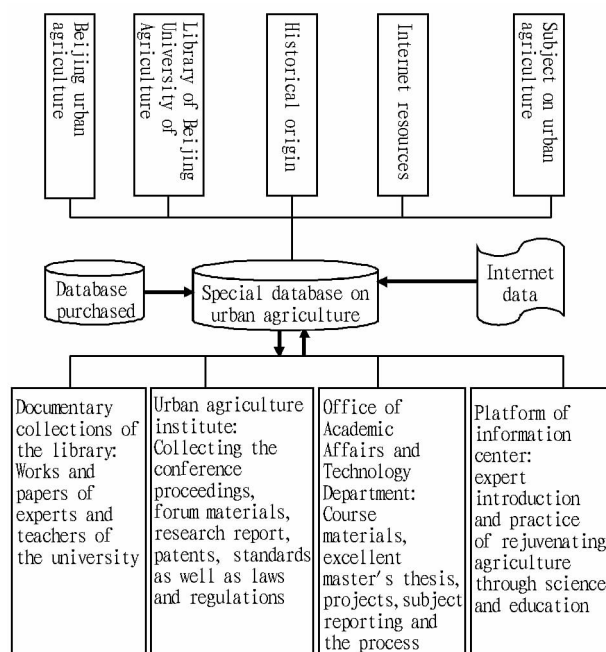


Fig.1 Structure Diagram of Special Database on Urban Agriculture

universities of Jiangsu can be used as an operation mode for reference.

3.3.2 Management and maintenance of special database on urban agriculture. In order to improve the quality of special database and strengthen cooperation and sharing between university libraries, the construction of special database shall be designed according to relevant international and domestic common standards, such as complying with relevant regulations on network structure, technical standard, bibliographic format, metadata, information interchange code and networking protocol *etc.* issued by the project management team of special database on CALIS subject; for the special database on urban agriculture that is initially constructed, the effect of it shall be evaluated and checked through test run in the early stage. Moreover, as the virtual resources are unstable, the virtual resources linked with the special database on urban agriculture shall be tested and verified regularly to ensure its effectiveness and usability. Therefore, the database must be updated and maintained frequently. In addition, the construction of the database is a long term process. With the development and deepening of urban agriculture, new research achievements and literature on urban agriculture will come out continually. Only real-time updating and maintaining the novel features of literature can ensure the continuous improvement and vitality of the database.

In conclusion, constructing the special database is an important teaching and research means for the library to serve the university, and is also an inevitable trend for the information service development of the library in the network environment. Though the special database on urban agriculture of the library of Beijing University of Agriculture has just taken shape, it is a good attempt for

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the development of special database on urban agriculture in our country. Upon completion of the special database, the library will strengthen the promotion and updating maintenance work for the special database to better serve the teaching research and local economic construction.

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