

Research on Service Function of Higher Vocational College Library Based on Big Data

Yanzi Xiao, Gang Chen*

Hunan Automotive Engineering College, Zhuzhou, Hunan, China

**Corresponding Author.*

Abstract: As one of the important places for talent training in higher vocational colleges, how to respond to users' needs accurately and quickly by using advanced technologies is the key direction of book management reform in higher vocational colleges. Based on the survey data, this paper analyzes the present situation of the service function of higher vocational college libraries in detail, and puts forward some countermeasures and suggestions on the service function of higher vocational college libraries based on big data, which provides strategic reference for further improving the construction level and service efficiency of libraries.

Keywords: Library; Book Resources; Big Data; Informatization; Service Function; Individual Service

1. Introduction

As an important place for talent cultivation in vocational colleges, libraries not only store a large amount of paper resources, but also a vast number of digital resources. The collection of book resources and their ability to serve education, teaching, and scientific research are important factors in measuring the conditions and level of a school's operation. For a long time, people's interpretation of library service functions has been too simplistic, mostly believing that it is the collection place of book resources and the concentrated place for teachers and students to borrow resources. Library staff are basically peripheral personnel of the unit, lacking proactive and effective analysis of a series of borrowing behavior data generated by teachers and students, let alone the optimization of work methods based on borrowing behavior of teachers and students and the optimization of library service functions. With the promotion of the blended teaching mode reform of "online + offline" in vocational colleges, higher requirements have been put forward for students'

self-learning ability. The behavior habits of students entering and exiting libraries for self-learning have become more frequent, resulting in a large amount of behavioral data. How to explore the inherent essence of these data, analyze the characteristics of students using book resources, and improve the service function and level of the library, enhance the utilization rate of book resources, and enhance the efficiency of readers accessing resources, all of which are worthy of further research and exploration. Therefore, actively exploring how to use big data technology to optimize the service functions of libraries is not only a need for the construction and development of vocational college libraries, but also a need to achieve precise services for teachers and students and provide scientific decision-making basis for the updating and supplementation of book resources.

2. Analysis of the Current Situation of Service Functions in Vocational College Libraries

2.1 Current Situation of Collection Resources in Vocational College Libraries

Due to the relatively short history of higher vocational education in China, most vocational colleges have been upgraded from secondary vocational schools, with a short establishment time. At the same time, due to the uneven regional development, various vocational colleges mainly focus on infrastructure and teaching conditions in promoting overall school construction, with limited investment in library and resource construction, and insufficient accumulation of book resources. The overall development of the library lags behind the construction of other teaching conditions, and the infrastructure, spatial layout, total book resources, and per capita book volume of the library do not match the needs of the school's development and talent cultivation. In addition, the speed and quantity of updating library

collection resources are difficult to meet the needs of vocational education, which is more evident in engineering vocational colleges. With the implementation of the National Vocational Education "Double High Plan", the gradual promotion of undergraduate level vocational education, and the promotion of local vocational education projects such as "Excellent Vocational Colleges", "First Class Vocational Colleges", and "First Class Professional Groups", the construction of vocational college libraries and their resources will usher in new development opportunities [1].

2.2 Current Situation of Service Functions of Vocational College Libraries

The research group selected students from Zhuzhou Vocational Education City in Hunan Province as the research subjects and conducted a survey on the current status of library service functions through online push questionnaires. A total of 120 valid questionnaires were received in this survey. Statistical analysis of the survey data shows that over 95.83% of students received library education or related training, 81.67% of students said they could borrow the books they wanted, but only 26.67% of students said that the library provides knowledge push for public literacy, and there is basically no promotion of professional knowledge. 37.5% of

students paid attention to the library's push for new book listings, as shown in Figure 1. In addition, interviews and surveys were conducted with some full-time teachers at Hunan Automotive Engineering Vocational College. Most of the teachers stated that the library can basically meet the requirements for updating professional books, but the support for resource construction in technology fields related to scientific research is limited and lacks personalized push.

From this, it can be seen that the current service functions of most vocational college libraries are still relatively single, mainly for borrowing book resources, that is, providing book resource borrowing services to teachers and students on campus, including book resource information retrieval, electronic resource retrieval, paper resource borrowing, and information resource collection and organization. Based on the behavioral data and actual needs of the use of teacher and student book resources, data analysis and research are conducted. Targeted provision of value services is insufficient, such as personalized push services, specialized knowledge topic services, teaching resource promotion services that combine teaching needs, and specialized services that serve the scientific research needs of teachers.

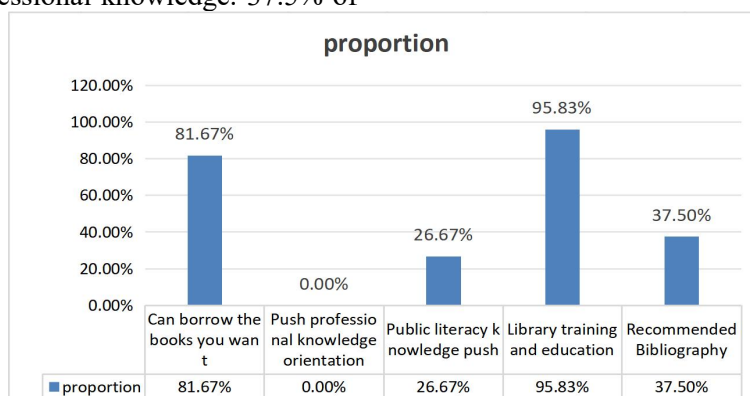


Figure 1. Survey and Analysis of the Current Status of Library Service Functions

2.3 Current situation of Information Construction in Vocational College Libraries

In recent years, with the advancement of information technology construction in vocational colleges in China, big data technology has gradually been applied in the education, teaching, and administrative management of vocational colleges. As of now, due to the uneven economic development in various regions, the investment in information technology construction is uneven, and the level

of development is uneven. The overall effect of the application of big data technology is average. At present, leading vocational colleges are vigorously promoting information technology construction, mainly focusing on the informatization construction of teaching resources, administrative management, and the construction of information big data platforms for student growth processes. However, the investment in the construction of intelligent platforms in libraries is not significant. The

websites of vocational college libraries lack intelligent search and interactive functions, and the role of big data technology in library service functions is limited. For example, using big data technology to classify, analyze, and mine the professional sources of borrowers, types of borrowed book resources, browsing status of electronic resources, and feedback from readers, in order to provide value services and other aspects [2].

3. Exploration of Service Functions of Vocational Libraries Based on Big Data

3.1 Analysis of Main Theoretical Research in China

On China National Knowledge Infrastructure (CNKI), a search was conducted under the titles "Big Data", "Library", and "Vocational College". The data showed that as of July 7, 2022, there were 84 research papers related to the service functions of vocational college libraries. Most of the research focuses on the following three aspects: firstly, the study of library service models based on big data. For example, Li Yan analyzed the problems in the service of vocational college libraries in the big data environment in her exploration of innovative services in the context of big data and proposed that vocational college libraries need to change traditional management models, innovate service methods, and promote the improvement of service role of vocational college libraries [3,4]. The second is the research on the construction strategy of libraries based on big data. For example, Liu Peng pointed out in his research on the construction of digital libraries in vocational colleges in the era of big data that it is necessary to pay attention to the construction of information infrastructure, follow personalized services, propose the construction of "smart libraries", and discuss the resource allocation and functional positioning of libraries [5]. The third is the study of the role of big data technology in library service functions. Pan

Qiong and Yang Haiyan believe that libraries can fully utilize big data technology to deeply explore data resources and explore the potential application value of book resources [6]. Zhang Yanxia, Liu Lijie, and others pointed out the need to fully apply big data technology for mining and analysis, further improving the service quality of the library, which will become an important guarantee for the smooth progress of daily work in the library [7-8].

3.2 Research and Analysis Focusing on Service Functions

The project team found through research that with the application and promotion of information technologies such as big data and artificial intelligence, young students in the new era have new requirements for the service functions of the library. The top five service functions they are most concerned about include: facial recognition and borrowing account binding, comfortable electronic reading rooms and reading spaces, the ability to read e-books on mobile phones through apps, and the ability to push e-books of personal interest Promptly release new books from the library. In terms of the most concerned book resources, including professional and technical skills books, humanities and comprehensive literacy books, certification/English exam/college entrance examination resources, magazines, etc., as shown in Table 1. It can be seen that students hope the library can provide an intelligent and comfortable borrowing environment, as well as convenient and targeted resource services. At the same time, students have a clearer demand for resources and hope to find what they want in the library to serve their personal growth. In the survey of teachers, it was found that there are two main types of resources that teachers are most concerned about: academic resources that serve scientific research needs, and the latest professional and technical book resources that reflect the growth needs of vocational college teachers.

Table 1. Library Service Functions and Resources That Students Pay the Most Attention to

The most concerned service function		The most concerned resource	
1	Can brush face recognition and book borrowing account binding	1	Professional and technical skills of the book resources
2	There is a comfortable electronic reading room and reading space	2	Humanities and comprehensive literacy book resources
3	I can read electronic books on my mobile phone through the APP	3	Certificate, English test, upgrade this examination resources

4	Can push electronic books that individuals interest interested	4	Graduation project reference database
5	Publish new books from the library in time	5	magazine

4. Analysis of Countermeasures for the Service Functions of Vocational College Libraries Based on Big Data

4.1 Optimizing the Library Network Service Platform Based on Big Data Analysis

A clear and practical library network platform that not only gives readers a good first impression of the library and enhances the reputation of the school among teachers and students, but also facilitates readers to search for book information resources, timely understand the borrowing dynamics of library resources, the latest collection resources, and personalized customized push services [9,10]. The service function architecture of vocational college libraries should include four functional modules: library overview, reader service, digital resource platform, and growth platform. The functional architecture is shown in Figure 2. The reader service platform should have functions such as account registration, borrowing and browsing

information statistics, and reader information analysis and promotion. It can set up functions such as book resource inquiry, personal information push, book resource dynamics, reader comments, and electronic borrowing card processing; the digital resource platform should include both on campus and off campus digital resource platforms. On campus digital resource platforms need to connect with on campus e-book resources and on campus course resource platforms. Off campus digital resource platforms should include academic and literary platforms such as CNKI, Wanfang Database, and VIP, as well as book resource platforms such as Chaoxing Library and Readshow Database, and course learning platforms such as iCourse. At the same time, libraries should also promote the construction of student clubs, promote academic lectures, open reading forums, etc., further enrich the campus cultural atmosphere, and serve the growth of students.

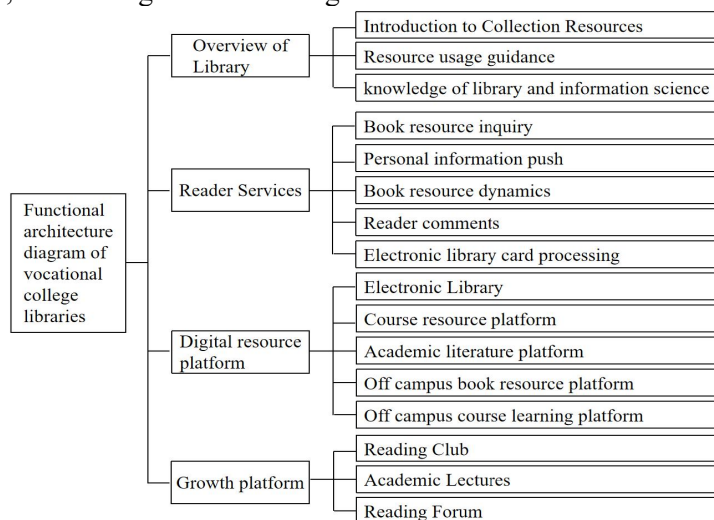


Figure 2. Library Service Function Architecture

4

4.2 Building a Rich Library Collection of Paper and Digital Resources

In terms of library collection resource construction, vocational colleges should focus on the following four aspects of resource construction in addition to general resource construction. One is to build humanistic book resources and comprehensive literacy growth resources that meet the growth needs of vocational college students, such as traditional cultural book resources, regional characteristic

cultural resources, political theory book resources, etiquette cultivation and interpersonal communication book resources; Secondly, vocational college libraries should build supporting professional book resources according to the needs of the school's professional construction, especially the construction of applied book resources with professional attributes, and timely provide professional book resources for industry and enterprise new standards, new processes, new

technologies, and new material applications; Thirdly, according to the growth needs of students, it is necessary to provide book resources that are in line with their educational background and the growth of composite talents. The fourth is to build a smart digital library. Vocational colleges need to build systematic digital book resources and apply big data technology to build personalized push services, while also building paper resources for the above collections, to enhance the function of education and teaching services. At the same time, it is necessary to purchase commercial information databases such as China National Knowledge Infrastructure, Readshow Academic, Wanfang Paper, and Chaoxing Mobile Reading Platform, and provide targeted push notifications according to the needs of teachers and students, providing readers with multi-dimensional digital resource services and enhancing the sharing service function of book resources.

4.3 Implementing Personalized Push Services Based on Big Data Technology

With the changes in learning methods, the demand for knowledge among teachers and students has become fragmented, and new requirements have been put forward for fast and accurate knowledge acquisition. The traditional way of spending a lot of time searching for paper resources in libraries to obtain knowledge has been changing. Therefore, the demand-based push services provided by libraries have been welcomed by a large number of teachers and students [11-13]. In order to better carry out personalized push services, the following work needs to be further streamlined. One is to analyze, statistically analyze, and research the borrowing of book resources and browsing data of digital resources for teachers and students. For example, by analyzing and studying the professional classification of students,

optimizing the construction of book resources for key professional categories, and carrying out professional book push services; By analyzing the classification and browsing statistics of digital resources, optimizing the construction direction of digital resources, and carrying out targeted promotion of digital resources; The second is to analyze the statistics of individual learning behaviors of teachers and students, capture the key knowledge information they are concerned about, and carry out targeted knowledge push services; Thirdly, the library can also conduct bulk targeted promotion based on the nature of special activities such as academic lectures and craftsmanship lectures, to enhance the promotional effect and participation of the activities.

The process and model of personalized precision service technology based on big data are shown in Figure 3. Focusing on reader users, this study obtains the characteristic quantity of precise library services from the aspects of information retrieval of book resources, personalized service information push, borrowing and returning behavior information reminder, electronic resource borrowing cloud service, and library intelligent environment construction. Through expert consultation and reader research, it screens and organizes the characteristic quantity of precise library services in vocational colleges, and constructs a multi-dimensional feature system. Based on feature quantity and library reader behavior data, this paper supports precise service decision-making in university libraries through group feature clustering analysis, forming a precise service analysis model that integrates elements such as data collection and processing, reader feature system construction, multi perspective clustering of user groups, group feature analysis, and accurate user profiling.

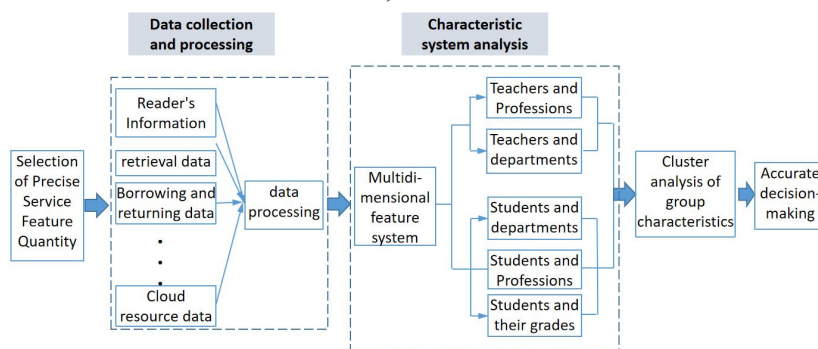


Figure 3. Process and Model of Personalized Precision Service Technology Based on Big Data

4.4 Enhancing the Information Technology Literacy of Library Staff

To promote the informatization of book management based on big data, it is necessary to further enhance the information literacy of library staff in vocational colleges. One is that library staff are no longer just single book borrowing workers, but organizers, planners, and participants who provide book resource services to teachers and students. Therefore, staff need to have a certain depth of understanding of vocational education, and their work content, work methods, and work thinking need to be transformed, especially in carrying out personalized push services. Library staff are required to have the ability to judge, analyze, and summarize the book resource needs of the target audience, and have the ability to select and filter information resources, in order to provide readers with precise personalized services. The second is the key positions in the library, such as platform management, information resource push, and other technical positions. The responsibilities of staff are not only simple book borrowing and scanning, but also the application management of the book management information system, related software platforms, and library websites. Therefore, to promote the informatization of book management and services based on big data, high-quality book resource management technicians are needed^[14-15].

5. Conclusions

Overall, based on big data such as reader borrowing behavior and knowledge focus, and according to the characteristics of vocational schools and the ways for students to develop knowledge and skills, advanced technologies such as big data technology and artificial intelligence are used to accurately and quickly respond to user needs, providing high-quality public and personalized services to enhance the service efficiency of vocational school libraries. This has significant theoretical value and practical significance. How to improve the service function of vocational college libraries based on big data needs to be improved from the following aspects: firstly, building a library network service platform based on big data analysis; secondly, developing rich and diverse digital resources of library collections; thirdly, implementing personalized push services based on big data technology according to the needs of

readers; fourthly, comprehensively enhancing the information technology literacy of library staff.

Acknowledgments

This work was supported by the Hunan Provincial Department of Education Scientific Research Project (22C1016).

References

- [1] Li Jingcheng Research on the Construction of Literature Resources in Vocational College Libraries under the Background of the "Double High Plan". *Library Work and Research*, 2023 (01): 76-81+90
- [2] Wei Jinhua. Current Situation and Improvement Measures of Library Management Informatization Construction. *China Press*, 2023 (08): 62-63
- [3] Li Yan. Exploration of Innovative Services in Higher Vocational College Libraries under the Background of Big Data. *Modern Vocational Education*, 2020 (02): 166-167
- [4] Chen Lin. Research on Innovative Construction and Management Models of Vocational College Libraries in the Era of Big Data. *Knowledge Economy*, 2018 (16): 82-83
- [5] Liu Peng. Research on the Construction of Digital Libraries in Vocational Colleges in the Era of Big Data. *Liaoning Journal of Vocational Education*, 2020 (07): 109-112
- [6] Pan Qiong. Research on the Construction of Digital Libraries in Vocational Colleges in the Era of Big Data. *Science and Technology Information*, 2019 (04): 194
- [7] Zhang Yanxia. Research on the Service Function of Vocational College Libraries in the Era of Big Data. *Shijiazhuang: Hebei Normal University*, 2019
- [8] Liu Lijie. New positioning of big data and university library service functions. *Journal of University Library and Information Science*, 2017 (09): 26-29
- [9] Zhao Cheng. Investigation of Reader Consultation Column on Mobile Network Platforms of Public Libraries at or above the Provincial Level. *Office Business*, 2021 (24): 131-132
- [10] Liu Zhaowei Construction of library smart service platform under the environment of "Internet plus service". *Science and Technology and Innovation*, 2023 (13): 51-54

- [11] Ma Xiaoyue, Ma Hao. Research on personalized recommendation methods for book resources considering labeled emotional information. *Intelligence Theory and Practice*, 2020 (09): 115-124
- [12] Zou Hong. Research on the Innovative Path of Public Library Book Management in the Era of Big Data. *Henan Journal of Library Science*, 2023 (05): 45-48
- [13] Sun Guohua. Research on Utilizing Big Data to Achieve Precise Library Services. *Office Business*, 2024 (03): 184-186
- [14] Yan Jianxin, Yi Jing, Hu Hongxiao, et al. Reflection on the synchronous improvement of digital transformation and librarian literacy in university libraries under the big data environment. *Information Systems Engineering*, 2024 (01): 113-116
- [15] Zhang Yue. Research on Innovative Development of Higher Education Management from the Perspective of Big Data. *Journal of Suihua University*, 2024,44 (03): 124-126.