

Research on Service Innovation of University Libraries Based on Big Data: A Case Study of Qingdao University of Science and Technology

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Abstract: In the era of big data, new environments, new technologies, and new demands have brought a huge impact on the traditional service model of libraries. The traditional resource-based services of libraries can no longer meet the current reading needs of readers, and the new development model is changing from resource driven to service oriented. Providing unlimited services with limited resources has become the goal of the development of modern university libraries. Taking the service innovation of Qingdao University of Science and Technology as an example, this article studies the challenges faced by university library reader service in the era of big data, and puts forward suggestions to improve the service level of university library readers.

1. Introduction

The rich data resources provide strong support for the reform and innovation of reader service in university libraries, and provide new development ideas for the innovative development of reader service. Taking the service innovation of Qingdao University of Science and Technology as an example, this paper studies the challenges faced by university library reader service in the era of big data, and puts forward some suggestions to improve the level of university library reader service. To find effective information in multifaceted data information, it is necessary not only to maintain the uniqueness of university library service on the basis of common service, but also to strengthen the research on the innovative mode and method of library service. Through the construction of library service sharing platform and cloud service mode, this paper puts forward the innovation strategy of library service in the era of big data, improves the efficiency of library resource integration in the form of regional alliance, realizes the large-scale management and reservation of library resources, and realizes the innovation of service content. It provides practical basis for the service innovation of university library.

With the rapid development of modern science and technology and the advent of the mobile network era, libraries must carry out innovation in their development [1]. The development of new technology has brought unprecedented vigor and vitality to the library. The rapid development of digitization of literature resources, the popularization of network storage and resource sharing, and the introduction of emerging technologies such as mobile reading, mobile phone service and cloud technology have changed the pattern of readers' demand for information. Under the influence of

new technology, great changes have taken place in the service concept and service means of library, and the new technological environment will inevitably bring new services. How university libraries cope with the challenges and opportunities brought by new technology, new environment and new demands; Constantly try, explore, and strive to innovate the way of service; It has become an urgent problem for university libraries to expand their functions.

2. The Necessity of Service Innovation in University Libraries

2.1. Service Innovation in University Libraries is an External Requirement to Adapt to Changes in the Social Environment

The development of libraries has evolved with the development and progress of society, from focusing on collection, to placing equal emphasis on collection and use, and then to focusing on use. The functions of libraries are constantly changing with the development of society. From ancient library buildings, which only provided reading and borrowing services for a small number of people in a certain area, to current full-time services that are not limited by time and space through the Internet and artificial intelligence technology, greatly facilitating readers' use of libraries to obtain information. Therefore, the focus of university library work has shifted from collecting and collating literature to better serving teachers and students. Innovating service methods and improving service efficiency is in line with the needs of modern information technology, and is also an inevitable requirement of national and social development strategies.

2.2. Library Service Innovation is an Inherent Requirement for the Self-development of University Libraries

The construction and development of university libraries should adapt to the construction and development of schools, and the development level of university libraries is an important indicator of the overall level of universities [2]. In order to meet the diverse and differentiated needs of teachers and students, university libraries must make corresponding adjustments according to the changes in their environment. (1) Each university library should collect various books and periodicals and conduct scientific processing and management based on the nature and tasks of the school, its key disciplines, and specialty characteristics. (2) In the era of big data, with the increasing popularity of other handheld electronic reading devices such as iPads, smartphones, and Kindles on university campuses, the number of paper books borrowed from university libraries has shown a significant downward trend, while the demand for online resources such as e-books and databases has significantly increased. How to solve the low utilization rate of paper books and periodicals, as well as the fragmented and shallow use of electronic books and databases, correctly guide readers' reading habits, and shift reading towards depth and refinement, is also a major problem that needs to be solved in the development of university libraries. (3) With the popularization of the Internet, everyone can become a publisher and disseminator of information, which will inevitably lead to a sharp increase in the amount of information. Useful information and useless information are mixed together, making it difficult to distinguish the true from the false. At this time, university libraries should use their talent advantages to organize experts in the field of library information, eliminate the rough and extract the fine, and screen out resources that are truly beneficial to the teaching, research, and learning of university teachers and students. At the same time, university libraries should also actively carry out user education, cultivate the information awareness of teachers and students and the ability to identify and retrieve information resources, so that teachers and students can quickly retrieve the information they need in the ocean of information. (4) University libraries are guaranteed to operate by financial input from national or local

governments. Therefore, in order to promote the socio-economic development of the country and local governments, they serve as a think tank advisor when formulating relevant policies and plans. In order to cooperate with this work, university libraries must improve their own work, innovate service methods, vigorously develop literature and information resources, provide high-quality information reference and consulting services, and provide practical opinions and suggestions for national and local socialist construction [3].

3. Current Situation of Service Development of University Libraries

With the rapid development of China's economy, the comprehensive strength of the country has been greatly enhanced, and the era of big data has arrived. The state has continuously increased its investment in education, and the cause of university libraries has also flourished. The vast majority of university libraries have further improved in hardware and software, but due to the impact of traditional concepts, personnel quality, and other factors, the current service situation of university libraries still has many unsatisfactory aspects, mainly manifested in the following three aspects.

3.1. Old Service Concepts and Low Service Efficiency

Service is the basic attribute of university libraries. Whether the service is well done or not, the satisfaction of teachers and students directly reflects the level of university libraries [4]. At the present stage, the management service concept of some university libraries is still outdated and backward, regarding readers as the object of management. Library work starts from facilitating the management of the library itself, without truly understanding the purpose of the library to serve readers. All work should focus on readers [5]. In addition, some librarians lack a sense of crisis and competition, have unclear career development plans, lack goals, and lack recognition of their own self-worth, and muddle along. This kind of work attitude and style leads to the low quality of reader service in university libraries, and affects the exertion of social benefits of libraries.

3.2. The Service Collection Resource Base is Weak and cannot Meet the Information Needs of Teachers and Students

The function and value of university libraries in the new era cannot be realized without rich collection resources. The exertion of library functions largely depends on the collection of library resources [6]. The construction and allocation of literature resources are mainly through government investment. Although China's overall economic and social achievements have attracted worldwide attention through nearly 40 years of reform and opening up, due to the uneven development of each province, autonomous region, and municipality directly under the Central Government, the funds allocated to various universities also vary greatly. Adequate funding can be obtained for national key universities and "double top" universities; however, for local colleges and universities in underdeveloped provinces and autonomous regions, the funds obtained by libraries are obviously insufficient. Currently, the procurement of library resources should not only ensure the collection of paper books and periodicals, but also take into account the collection of audio-visual materials and local characteristic documents. At the same time, it is also necessary to invest heavily in providing support for databases increasingly favored by teachers. Therefore, in the collection of information resources, university libraries often ignore one aspect and lose the other, often abandoning the quantity of copies in order to maintain the quantity.

3.3. Single Service Means, Unable to Meet Differentiated Needs

University libraries cannot make their services meet the needs of teachers and students without the support and guarantee of advanced technology [7]. Currently, university libraries still remain in the traditional service mode, mainly lending and returning paper books. University libraries have formed islands of information, failing to socialize the use of library resources. Nowadays, college students are a new generation growing up with the Internet, with active thinking, strong ability to accept new things, broad horizons, and broad interests. Their information needs vary from person to person, with diverse and differentiated characteristics. Therefore, the traditional service model has lagged far behind the current information needs of college students. Currently, the technology widely used in university libraries is only used for the positioning of books, staying in the integrated library management system, which is only more convenient for readers to borrow and return books and journals and for the statistical work of internal data in the library. However, it is also limited in solving the personalized and differentiated information needs of modern college students.

4. The Path of Service Innovation in University Libraries

In the era of big data and the transformation period, in order to improve the service quality and meet the information resource needs of teachers and students, university libraries must improve their service concepts, service content, and service methods, and propose targeted solutions to solve problems in order to promote the development of university libraries.

4.1. Establish a Service Concept of "People-oriented, Reader First" to Improve the Quality of Librarians

University libraries are institutions that collect, organize, store, transmit, and develop document information, and provide scientific and cultural education and information services to teachers and students. First of all, in order to do a good job in service work, it is necessary to regularly carry out ideological education of "people-oriented, reader first" for librarians, so that they can remove the concept of passive service, actively participate in the work, and not forget the original intention and mission of librarians. Secondly, to do a good job in service, it is necessary to create a quiet and comfortable environment for readers and strive to provide thoughtful services.

4.2. Improve the Procurement Mode of Literature Resources and Enrich Library Resources

Library collection resources are the material foundation of university libraries, and are not something that can be done simply by investing funds [8]. Library collection resources are related to whether a library can establish a scientific and reasonable document resource system and meet the needs of teachers and students for document information to the maximum extent [9]. Firstly, university libraries must formulate correct policies based on the national development strategy and the university's own positioning, providing macro guidance for the construction of library resources. At the school level, the library work committee is composed of teacher and student representatives from the library and various colleges to formulate the planning and work of the school library. Secondly, it is necessary to fully strengthen the contact with college teachers, through regular visits, holding symposiums, issuing subscription bibliographies, and other methods, using the professional knowledge of teachers to master the latest and cutting-edge academic works and other scientific research achievements, timely conduct subscription procurement for them, and accelerate the timeliness of library collections. Thirdly, a resource construction and procurement team should also be established within the library to draw up the allocation ratio of funds for the library's paper books,

periodicals, CD-ROMs, databases, and e-books, and to agree on the scope of key disciplines, characteristic collections, and local documents, so that the library's funds can be used scientifically and reasonably, not only ensuring the basic needs of readers, but also highlighting characteristics. Avoid purchasing library resources that focus on documents in a particular discipline due to personal preferences. You can also try to collaborate with other university libraries and public libraries to build a library alliance system to achieve the sharing of collection resources among libraries.

4.3. Relying on the Power of Technology to Meet the Personalized and Differentiated Needs of Readers

From traditional library, digital library to intelligent library, it is an inevitable trend of library development. Smart library is a new generation of technology as the carrier, through a more intelligent form, to reshape the interactive relationship between users and the library system, thereby improving the flexibility and convenience of the interactive process, and effectively constructing an intelligent library management and service model [10]. With the continuous emergence of new technologies such as the Internet, the Internet of Things, artificial intelligence, big data, and network cloud, they are increasingly being applied to library business. University libraries can improve their service quality from the following aspects. First of all, actively use "WeChat" platforms such as Weibo, WeChat and WeChat official account to upgrade traditional service projects such as notice notices, new book bibliography, reading promotion, database retrieval methods, etc., so as to achieve online and offline simultaneously, so that the information sent by the library can be available to readers anytime and anywhere; Arrange specialized personnel to maintain the micro platform, interact with readers in real time, understand their needs, and respond. Secondly, give full play to the advantages of big data, increase the collection and analysis of reader data, conduct research on reader needs, and grasp the personal characteristics of readers, including cognitive ability, knowledge and experience, task goals, and social dependency, while protecting the privacy of readers. Deeply mine the personalized preferences of readers, extract key information, and use it for information decision-making to meet the personalized and differentiated information needs of readers [11]. Finally, rely on the Internet of Things and the modern express industry to achieve the co construction, sharing, and sharing of resources. The funding for each university library is limited, but resources such as books, periodicals, and databases are infinite and growing exponentially. With the help of modern technology, the collection resources of each university library can be maximized and their maximum social and economic benefits can be brought into play.

5. Research on Service Innovation Scheme of Qingdao University of Science and Technology Library

Service innovation is the source of power for library development and an effective way to realize library value. In recent years, the Library of Qingdao University of Science and Technology has adhered to the service concept of "reader oriented" and "big service", improving existing services, developing new services, and improving service capabilities based on the constantly changing needs of readers.

5.1. Improve Basic Services - Launch a "Book Selection and I'll Pay" Service for all Teachers and Students in the School

Under the influence of the big data environment, the reading methods of readers have changed,

and it has become an indisputable fact that the borrowing volume of paper books in various university libraries has continuously decreased. How to enhance readers' interest in paper books, increase the amount of paper books borrowed, and adjust and optimize the library borrowing system are the most direct means. In order to further promote the construction of school literature resources and build a literature resource construction model driven by the needs of teachers and students, the Library Literature Resource Construction Center of Qingdao University of Science and Technology and Qingdao Book City jointly launched the "Youth Science Reading - You Choose Books, I Pay" activity. This activity has been officially launched since July 1, 2019. Teachers, students, and employees can take qualified books "free" from the Qingdao Book City with the campus all-in-one card. Online and offline book selection activities are now being carried out simultaneously and comprehensively, and the relevant borrowing rules are the same as those for books in the library. This activity brings book resources closer to the needs of teachers and students, expands the channels for recommending books, and drives the enthusiasm of teachers and students to participate in purchasing and reading.

5.2. Create the First University Institutional Knowledge Base in Shandong Province

In 2021, the Library of Qingdao University of Science and Technology became the first "China Knowledge Network Institutional Knowledge Base National Demonstration Base" for universities in China, making the construction of Qingdao University of Science and Technology's institutional knowledge base at the forefront of universities in the country. Through many years of construction, the current institutional knowledge base not only provides a new search engine for innovative library work, but also serves key tasks such as job recruitment and professional title evaluation in schools, playing an important role in the construction of smart campus in schools, and promoting the service of big data in teaching, scientific research, and smart campus construction.

5.3. Creating Campus Culture Brand Service - Reading Festival

Over the past 70 years, Qingdao University of Science and Technology has formed its own campus culture and accumulated a relatively profound cultural heritage through the hard efforts of several generations. The library, as a specific cultural service place, undertakes the mission of inheriting and promoting the traditional culture of the school. The "Reading Festival" of Qingdao University of Science and Technology, as an important part of campus cultural construction, has a clear theme, rich content, and diverse forms, and has an increasing impact on the entire school's teachers and students. The "Reading Festival" activity has become one of the enduring brands of campus cultural construction.

To play an important role in further building the "Academic Science and Technology University". It has also further created a cultural atmosphere for teachers and students to "love reading, read good books, and read well", continuously enhancing their cultural cultivation and life taste. For example, special bookshelves were added, such as "The Complete Works of Lu Xun". In addition to setting up special bookshelves, the library also opened a series of special databases with China National Knowledge Network, and made use of websites, official accounts and other platforms to create an immersive, multi-directional and three-dimensional learning platform online and offline.

Good ecological environment breeds excellent campus cultural brands. The Reading Festival activities contribute to the development of campus culture. For example, the "Cloud Exhibition" activity of teaching achievements in the design major of Qingdao University of Science and Technology, jointly organized by the library, the Academic Affairs Office, and the Academy of Arts, fully demonstrates the teaching achievements in the design major of our university. These excellent works exhibitions are all derived from the scientific and technological innovation of

students. In addition, the library has held many excellent photography exhibitions, collecting many excellent works around the theme of "Beautiful Campus". In addition, an exhibition of "Library Cup" themed poster creative design solicitation activities is also held to solicit image works such as themed posters, illustrations, comics, expression packs, library tickets, etc. from readers. Excellent works are selected through online contributions, and excellent poster works are displayed. Through creative design, the concept of encouraging and promoting reading is conveyed. The library also held activities such as soliciting articles and collecting original poems, greatly enriching the forms of activities.

5.4. Carrying out Intellectual Property Campus Cultural Activities

Today, with the rapid development of science and technology, intellectual property has gradually become an important strategic resource in international competition, and the economic and social value it brings has become a new opportunity for economic development in various countries. Intellectual property talents are an important resource for the intellectual property cause, and cultivating intellectual property talents is the foundation and prerequisite for using intellectual property strategic weapons to develop the economy. Colleges and universities are the main battlefield for the cultivation and awareness protection of intellectual property talents, and strengthening the cultivation of intellectual property talents is also a common demand of society. The Intellectual Property Service Center of Qingdao University of Science and Technology is attached to the library. Since its establishment, the Center has paid special attention to the cultivation of intellectual property talents and carried out a series of intellectual property campus cultural activities. The Center held intellectual property knowledge competitions using important nodes such as World Intellectual Property Day and China Patent Week. Examining students' basic knowledge of intellectual property rights and their ability to retrieve patents has enhanced their awareness of intellectual property protection.

6. Conclusion

Service is the eternal theme of library work, and innovation is the driving force of library development. Libraries must base themselves on the needs of readers, continuously innovate and practice, and provide inexhaustible power for their own development. The future library must be an interactive integration of people, resources, and space. All work in university libraries must be centered on the needs of readers, providing personalized customized services and scene-based experience services based on the differences in the needs of library users. Only in this way can the innovative services of the library be done better and go further. Qingdao University of Science and Technology Library takes practical actions to lead the service innovation. From building the knowledge base of the university institution to the intellectual property center of the university, from holding colorful reading festivals to "I pay for the books you choose" activities, all reflect the service concept of centering on the needs of readers and taking the library development as its own responsibility. From the development process of library service innovation of Qingdao University of Science and Technology, we find that service consciousness is the fundamental guiding ideology, thought innovation is the action guidance, the two complements help each other, promote the development of university library. To sum up, in order to complete the service innovation task of university library under the background of big data, it is necessary to establish the consciousness of service innovation, develop innovative ideas, improve the service innovation system of university library, coordinate the digital service innovation resources, engender the universality of library service innovation, and realize the goal of library service innovation under the guidance of the principles of people-oriented, practical, flexible and changeable. Assisting the construction and

development of colleges and universities.

References

- [1] Pan Wenjun. *Analysis on the Current situation of Digital Library Service in the Internet Era*. *Lantai Journal of Internal and External Studies*, 2021, 22 (4): 67-69.
- [2] Jun Liu. *Service Innovation of University Library in the Big Data Era*. *International Journal of Frontiers in Sociology*, 2021, 3.0 (1.0).
- [3] Tao Xu, Yao Guo, Lin Wu. *Research on Service Innovation of University Library under the Background of Informatization*. *Frontiers in Educational Research*, 2022, 5.0 (10.0).
- [4] Meng Xiangbao, Ye Lan. *Analysis and Reflection on the Winning Cases of the First National University Library Service Innovation Case Competition*. *Library and Information Work*, 2015, 59 (03): 42-49.
- [5] Liu Yaqiong, Xiao Long. *Research on the Innovative Development Trend of User Service in University Libraries*. *Library and Information Work*, 2015, 59 (20): 34-40+93.
- [6] Cui Bo. *Investigation and Analysis of the Establishment and Operation of University Reading Festival*. *Library and Information Work*, 2015, 59 (20): 6-11.
- [7] Wang Xiaoyan, Li Jian. *Research on the VR Application of Library Reader Service*. *University Library Work*, 2020 (6): 70-74.
- [8] Chen Qun. *Reflections on the "people-oriented" reader service work in university libraries from a new perspective*. *Science and Technology Information*, 2022 (9): 207-209.
- [9] Hu Changping. *Research Progress in Information Resource Management*. Wuhan: Wuhan University Press, 2017:43
- [10] Wang Pai. *Research on the Innovation of Reader Service in University Libraries in the Digital Era*. *Journal of Suihua University*, 2021 (8): 141-143.
- [11] Li Muzi, Cui Yi. *Research on the Application of Path Goal Theory in Reader Service in University Libraries*. *Henan Journal of Library Science*, 2022 (1): 60-62.