

LETTER TO THE EDITOR

Key Points of Computational Neuroscience in Circulation

Service Innovation of University Library

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This article researched the main points of innovation of circulation service of university library. RFID technology was applied to a university library and a “simplified” self-service system based on RFID circulation service system was designed to compare the whole difference before and after this design. By calculating the genetic algorithm in neuroscience, the volume of circulation of this library was predicted. Through the circulation data, the designed method had applicability, which improved the self-help ability of reader and the satisfaction rate of reader. Meanwhile, the prediction data was reliable, which provided the basis for the scientific management of library circulation service.

I Introduction

Jianmei Mu. Buslaev published “Research on the Construction Mode of University Library from the Perspective of Ecological Environment Aesthetic Paradigm” on Issue: 107, Pages: 1473-1479, Article No: e107170, Year: 2019. It is important to study the ecological interior design of university libraries is a trend of its development. It is an inevitable requirement for building a harmonious society, especially a harmonious campus, and achieving sustainable and common development. It is to improve the overall level of the library, embody the people-oriented thinking and create a good atmosphere. The only way to go.

This article uses the mode and analysis of computational neurology to set the overall circulation rate of library as the brain and explores the new mechanism and ways of information processing, so as to innovate “brain” of library (the whole circulation rate). RFID technology is applied to the circulation innovation of a university library. Meanwhile, a simplified self-service system based on RFID circulation service system is designed.

Tugcu proposes to use computational neuroscience model to design self-memory robots for perceptual learning, and the self-service system is similar to main opinions of this article.

II Perspective

The application of RFID technology plays a significant role in improving the quality and efficiency of library circulation service (Wermter et al. 2001).

By researching RFID application service platform at home and abroad and combining the actual requirement and present situation of circulation service of library, we can get the application level framework based on RFID

circulation service, which is composed of five layers:

Application layer: it mainly includes the application service for readers provided by library. For example, autonomic borrowing and returning of book, three-dimensional navigation of circulation, personalized circulation service, book inventory, shelving books, shuffling bookshelf and so on.

Service layer: this layer is mainly responsible for providing the technical service required by the user. For example, library service, reader service, information retrieval, data collection, information exchange and coding analysis (Halchenko et al. 2012).

Platform layer: this layer is the core of whole framework, which includes RFID circulation service system and the standard and regulation required by all kinds of RFID.

Interface layer: this layer includes all interfaces required for all RFID application services. For example, RFID data interface, campus one-card interface, library service system interface.

The basic data layer: this layer includes all the basic information required by all kinds of RFID. For example: reader information, book information, holding information, borrowing and returning information, layer information and other information.

This paper designs a “simplified” self-service system in RFID circulation service system. This article focuses on the innovation of circulation service in a university library. This university library is composed of three university libraries. The merged library insists on “the reader’s needs is the highest knowledge” and the people-oriented. Meanwhile, it takes the construction of self-service system as the core and provides readers with self-service platform (Mu 2019). In the library, the center of new books, the center of science and engineering (one), the center of science and engineering (two), the center of science and engineering (three), the center of foreign language, the center of social science, the center of oceanography, the center of literature and art and other literature centers are established. There are 2135 seats in the reading room. The “combination of browse and read, division management”, “opening shelves-borrow system integration” and three-line resource allocation service system are implemented. According to readers’ needs, orderly and hierarchical management was gradually carried out in 2007. Meanwhile, the new book borrowing center was adjusted to the special management, which opens 24 hours a day in all year. In 2008, the 24-hour window of returning books was established. Thus, the readers’ continuity service demand for the library can be ensure and the self-service system of circulation service with “diversification of user education, characterization of resource allocation, ordering of time management, modernization of information service” has been gradually formed, which provides readers with self-service platform. This measure is based on the circulation service proposed by Xi, which is taken as the core service of university library. In order to adapt to the ever-changing circulation service in university library and satisfy the reader’s reading demand, we need to innovate continuously (Bouchard et al. 2016).

Based on the simplified self-service system, this article puts forward several key points for the innovation of circulation service of university library.

The user education combining “guidance” with “compulsion” is adopted. For rich information resource, if there is no reader to know how to use it, its circulation will be affected. Meanwhile, the value of the library cannot be brought into play. Therefore, to strengthen user education and management is a precondition to make effective use of library resource for university readers. The method combining teaching with examination is used to guide and force readers to use the library and explain library resource in depth (Fernando et al. 2010).

The document resource is allocated based on the floor. Then, we perform the three-line library collection: the first line library collection is the borrowing center for new book, the second line is the borrowing center of professional subject such as science and engineering, social science, foreign language, oceanography, literature

and art. The third line is the comprehensive stack room.

Characteristic resource allocation: firstly, the library provides characteristic service of all weather “new book borrowing center”, which includes thirty two kinds of new books in the last half of the year, so as to highlight the management of “new library collection, fast transmission, easy reading, all-weather service”, and then to reflect the advantage of service. Secondly, the library sets up a 24-hour simple returning book, and then builds a window at the counter of the hall of returning book. The stainless steel sheet is used as a transmission belt which transmitted the book to the bottom of simple carton. Thus, the library can serve readers at any time, which facilitates readers to make use of the library (Wang 2019).

The first one is self-help environment construction. Each borrowing center provides one retrieval machine and provides the unlimited Internet interface under the wall near the seat, which facilitates self-help learning of reader. The hall of returning books provides 10 retrieval machines, which provide the self-help service for readers to search and retrieve. The second one is information access system. The reader can query book, light disk, database, audio, and situation of library through the home page of library. On the basis of own retrieval habit and many retrieval points such as call numbers, book names, authors, subject words, classification numbers, Boolean logic and truncation symbol are applied to the modern network inquiry. Meanwhile, the public inquiry system can be used to inquire the book and the borrowing state. The third one is to provide non-real time network loss consultation system. The reader can use e-mail and message board to realize online consultation. The fourth one is the cooperation between traditional service and modern service. If user’s self-service ability cannot satisfy the information demand, the librarian should play a role of its professional service efficiency in time, so as to help readers to complete the consulting task and borrowing task (Mcneese et al. 2001).

From Table 2, the library lacks space. After the orderly management for the opening time of library, the opening hours of each borrowing center are 24, 14, 12 and 8 hours, and then the serialization is formed. The time management without rest day in the whole year shows the characteristics of personalized service, which meets the use of library at different time and achieves seamless connection of time.

The computing process to predict university library circulation by genetic algorithm is:

$$\hat{\chi}_t^{(1)} = e^{\hat{M}_{t-1}M} \chi^{(1)} \left(e^{\hat{M}(t-1)} - I \right) \cdot \hat{N} \chi_t^{(1)} (t = 1, 2, \dots, n); \hat{\chi}^{(0)} = \chi^{(0)} \quad (1)$$

$$\hat{\chi}^{(k)} = \hat{\chi}^{(1)}(k) - \hat{\chi}^{(1)}(k-1), (k = 2, 3, \dots, n) \quad (2)$$

The relative error = $\frac{|x_i^{(0)} - x_i^0|}{x_i^0}$, and the quadratic sum of error = $\sum_{i=1}^n (\hat{\chi}_i^{(0)} \hat{\chi}_i^{(0)})^2$.

In formula (1), $\hat{\chi}_t^{(1)}$ is the predicted value. The original sequence is $\hat{\chi}^{(0)}$. \hat{M} and \hat{N} re identification values. k and t denote the value of circulation parameter. e denotes the factor in the continuous time response function.

III Results

This university library implemented the “simplified” self-service system based on RFID circulation service system. Through continuous improvement, we summarized the situation before and after the implementing the “simplified” self-service system based on RFID circulation service system.

we can see that the open-shelf rate of book increases from 0.85 to 0.95 after using the “simplified” self-service system based on RFID circulation service system. The amount of book borrowing increases from 98177 books

/year to 114266 books /year. The borrowing rate of literature is reduced from 0.05 to 0.03. The opening time of library changes from 98 hours per week to 98 hours a week and 24 hours.

The service mode of library becomes the all open-shelf, one-stop window and self-help borrowing and returning mode. The utilization ratio of librarians is improved and the service diversity is improved. Meanwhile, the three-dimensional navigation is built, which has the quiet environment. The library provides the self-help borrowing and returning service, the manual borrowing and returning, the book positioning, the three-dimensional navigation, and personalized circulation reference. The intelligent circulation mode is realized. Thus, the traditional circulation inventory method is changed, which releases worker from hard manual work. The library spirit of “people-oriented” is reflected. Through the circulation service management and the user satisfaction, the empirical researches are compared before and after the use. It is not difficult to find the use of “simplified” self-service system based on RFID circulation service system greatly increases the overall circulation rate of library, which have epoch-making significance for the service concept and service mode of library circulation service. The significant effect “two happy events come at the same time” is obtained.

First happy event: the reader’s self-help ability was improved.

Second happy event: the number of readers coming to the library was increased and the satisfaction rate was also increased.

Third happy event: the special service highlighted advantages

Fourth happy event: relocation for role of librarian

IV The Innovative Thinking and Countermeasure Discussion of Circulation Service

Pang and Chen consider that the circulation service is the core of work in university library. They discuss the innovation of circulation service in university library from the aspects of service concept, service content, service link and reader activity. The library should abandon the traditional circulation service concept and establish the scientific management concept. Based on the guidance of RFID application, the library should provide the reader with fine service and meet the individualized requirement of reader to the maximum extent. But, the technology is only an important auxiliary to smoothly develop circulation service. In order to improve the service quality for reader, the key is to provide the reader with specific and detailed service, and then to reflect the concern for readers. Finally, the library takes reader’s demand as the initial starting point and ultimate goal.

The university library is not only to satisfy the students’ demand for knowledge, but also it is an important platform for academic communication, network information dissemination and cultural activities. To a certain extent, it supports the heavy teaching and scientific research work. Surla considers that it is necessary to model and realize the software system of library circulation, so as to satisfy the demand of library and library user for e-business. In order to realize the space innovation of circulation service, it is necessary to create a new circulation reading environment integrating collection, borrow, read, consultation and RFID for reader. For example, Unknown designed the new automatic library circulation system.

In order to realize the innovation of circulating library book collection system, the library should use RFID technology as the basis to improve the reader’s satisfaction and promote the enthusiasm and efficiency of librarian. Meanwhile, combined with the actual development of colleges and universities, the overall planning of library circulation service is carried out. According to the main borrowing and reading data and information of student, we build a new circulation book collection system with emphasis, characteristic, and value. In addition, the library should establish the correct idea of library management and realize the intelligent development of library. It is necessary to improve the book circulation management mode, the management quality and the

efficiency.

In order to satisfy the new requirement in new situation, the library should effectively train a number of compound talents. The modern librarian not only need excellent moral trait, but also need proficient and accurate information application ability and first-rate service ability, so as to provide the best circulation service for readers. The improvement of librarians' comprehensive quality can be achieved through many training methods, such as going out to study, on-the-job training and the one-to-one coaching.

V Conclusions

In this article, based on computational neuroscience, the genetic algorithm is used to predict the innovation effect of circulation service in university library and a "simplified" self-help service system based on RFID circulation service system is designed. The data of a university library shows that the proposed system improves the circulation rate of university library, which has certain practicability.

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