Discussion on Quality Management and Process Optimization of Book Cataloging

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Abstract. The quality control and process optimization of book cataloging are of great significance for improving the quality and level of library services. This study produced an in-depth analysis of the current situation and existing problems in the process of book cataloging, and explored various factors that effect the quality of cataloging data. A series of improvement measures have been proposed to address these issues, which had certain reference value for enhancing the accuracy and efficiency of book cataloging and improving the overall service quality of the library.

Keywords: Book Cataloging, Quality Control, Process Optimization, Library Service Quality.

1 Introduction

With the rapid increase of the number and types of books, the complexity of cataloging work also rises, which puts forward higher requirements for the professional quality and work efficiency of catalogers[1].

At present, there are still many problems in the cataloguing process, such as tedious workflow, time-consuming and labor-consuming, etc. Through in-depth research on the quality control method of book cataloging and optimization of cataloging process, we can ensure the accuracy and completeness of book information, thus improving the readers' satisfaction and library operation efficiency, and further more, improving the service level of the library[2].

For the common problems in the process of book cataloging, such as incorrect information entry, inaccurate classification, etc., domestic scholars have put forward corresponding solutions through in-depth analysis of their causes. These schemes include but are not limited to strengthening the professional training for catalogers, optimizing the functional design of cataloging software and establishing a perfect quality audit mechanism. The implementation of these measures not only improves the accuracy of cataloging work, but also improves the work efficiency to a certain extent.

Facing the new challenges brought by digitalization and networking, domestic researchers have also shown a positive attitude. Scholars have discussed how to inno-

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vate and optimize the cataloging process in the new environment. For example, some studies have proposed to use big data technology to deep mine the book information to meet the diversified information needs of readers[3]. Other researches focus on building a book cataloging platform based on cloud computing to realize resource sharing and work collaboratively, and further improve the overall efficiency of cataloging work.

In foreign countries the research on cataloging quality control and standardization of cataloging process started earlier, and has formed a relatively perfect theoretical system and practical experience. International cataloguing organizations, such as the International Library and Information Standardization Organization (ISO), provide unified guidance and norms for the cataloguing work of libraries in various countries by formulating and publishing a series of international standards[4].

This paper deeply analyzes the present situation and existing problems of book cataloging process, and discusses various factors affecting the quality of cataloging data. In view of these problems, this paper puts forward a series of improvement measures, which can be used to improve the accuracy and efficiency of book cataloging and the overall service quality of the library.

2 Analysis of Book Cataloging Process

2.1 Overview of the Book Cataloging Process

Book cataloging process is a vital part of library work, which ensures the accuracy and consistency of book information. Optimizing its various segments can provide readers with higher quality services.

In the stage of book receiving and acceptance, library staff need to carefully check the new books to ensure that the quantity, quality and content of books are consistent with the order list. Through strict receiving and acceptance process, we can find and deal with the problems existing in books in time, such as missing pages and misprint, so as to ensure the integrity of cataloging data.

Next stage is the book classification and coding. In this process, catalogers need to classify books according to their contents and characteristics, and assign unique codes to them. Through the reasonable classification and coding system, the effective management and utilization of the collection resources can be realized.

Book record and indexing are the core parts of cataloging work. In this process, catalogers need to describe the basic information of books in detail, including key information such as title, author, publishing house and publication date. At the same time, it is necessary to add keywords and indexes to books, so that readers can quickly find the book resources through various ways. The accuracy of the record and the depth of indexing directly affect the service quality of library and the satisfaction of readers[5].

The last stage is the compilation and examination of book catalogue. In this stage, catalogers need to sort out the cataloging information generated in the previous stage into a catalogue, and proofread it to ensure the accuracy and completeness of the catalogue.

2.2 Problems in the Cataloging Process

The problems existing in the process of cataloging not only affect the efficiency of cataloging work, but also pose a potential threat to the accuracy and usability of book information.

In the process of book receiving and acceptance, due to the lack of strict standards and norms in some libraries, books that do not meet the requirements are wrongly received. For example, books may have problems such as missing content, page number disorder or typographical errors, which will seriously affect readers' reading experience if they are not found and dealt with in time[6].

The problems of book classification and coding are mainly reflected in the disunity of classification standards and the lack of professionalism of classifiers. Because different classification standards in different libraries, books of the same type are classified into different categories, thus reducing the accuracy of catalogues and retrieval efficiency. For example, for some books in interdisciplinary or emerging fields, it is difficult to classify them accurately if the classifiers lack relevant knowledge background.

In the stage of book record and indexing, the diversity of record standards and indexing rules also brings challenges to cataloging work. Different libraries or cataloging systems may adopt different description formats and indexing rules, which will affect the accuracy and completeness of description information. In this case, it may be difficult for readers to obtain comprehensive and accurate information when searching books, and even missing information may occur[7].

2.3 Factors Affecting the Quality of Cataloging Data

The quality of data source is the basis of cataloging data quality. For example, if the title of a book in the original data is misspelled, this error will be used in cataloging, which results in not being able to find the correct book when searching.

The accuracy and consistency of cataloging standards have an important impact on the quality of cataloging data. If there are defects or inconsistencies in standards and specifications, catalogers will be confused and misunderstood in the implementation process, which will lead to the decline of the cataloging data quality.

The advancement of cataloging process and technology also has an impact on the quality of cataloging data. Advanced cataloging process and technology can improve the efficiency and accuracy of cataloging work and reduce the risk of factitious error.

The effectiveness of quality control and audit mechanism is the guarantee to ensure the quality of cataloging data. By establishing a perfect quality control and audit mechanism, errors and omissions in the cataloging process can be found and corrected in time to ensure the accuracy and completeness of cataloging data.

2.4 Analysis of the cause of the Problem

The reasons for the problems in the cataloging process are complex and diverse, which can be mainly attributed to the following aspects:

First, there is a lack of unified cataloging standards and norms. The disunity of standards and norms often leads to significant differences in cataloguing results among different libraries. This difference not only affects the accuracy and consistency of book information, but also brings many inconveniences to readers when using library services.

Second, the quality of data sources lacks reliability. If the original book information, such as book title, author, publishing house, content introduction, etc., is wrong or missing, it will directly affect the accuracy and completeness of cataloging data.

Third, the design and implementation of cataloging process are deficient. A scientific, reasonable and efficient cataloging process is an important guarantee to the smooth progress of book cataloging. In addition, the implementation of cataloging process also directly affects the cataloging quality and efficiency. If catalogers do not strictly follow the process, or the process itself has defects, it will lead to unsatisfactory cataloging results[8].

Fourth, there is a lack of effective quality control and audit mechanism. On the one hand, there may be a lack of quality management and audit personnel, or the number of these personnel is insufficient to meet the actual needs of cataloging work; On the other hand, the process of quality management and audit may be too simple or formalism to effectively find and correct errors and omissions in the cataloging process.

The application degree of advanced technology in the cataloging process also has an impact on the quality of cataloging data. If the cataloging technology adopted by libraries is backward or unreasonable, the efficiency and quality of cataloging work will be limited[9].

3 Quality Management and Process Optimization Strategies of Book Cataloging

3.1 Strategies for Improving Cataloging System

In the process of building a perfect cataloging system, it is particularly important to strengthen cooperation with the International Library and Information Standardization Organization. By connecting with international organizations, we can not only obtain international advanced cataloging standards and experiences in time, but also promote the unification and standardization of cataloging standards on a global scale.

It is also an indispensable part to comprehensively sort out and evaluate the existing cataloging standards. With the continuous progress of society and the rapid development of science and technology, some traditional cataloging standards may have been unable to fully meet the needs of modern libraries. Therefore, we need to organize experts and scholars to conduct in-depth research and analysis of these standards, find out the existing problems and deficiencies, and revise them according to actual needs.

Strengthening the publicity and training of cataloging standards is also the key to improve cataloging quality. We need to improve catalogers' cognition and application

ability to cataloging standards through various channels and methods, such as holding training courses or distributing publicity materials.

Establishing a long-term mechanism for updating standards is an important measure to cataloging system. With the changes of the times and the progress of technology, it is necessary to establish a scientific, flexible and efficient standard updating mechanism, and regularly review and revise cataloging standards to ensure that they always keep pace with the times and provide strong support and guarantee to book cataloging.

3.2 Measures to Strengthen Cataloging Data Quality

In order to improve the quality of cataloging in an all-round way, we must implement a series of quality management measures from multiple dimensions.

First, establish strict cataloging quality standards and norms. These standards and specifications should cover all aspects of cataloging, from book receiving and acceptance, to classification and coding, to recording and indexing, and finally catalogue compilation and audit. Each stage should have clear quality indicators and operational requirements to ensure that every step of the cataloging work meets the established standards. At the same time, these standards and specifications need to be operable and measurable, so that catalogers can apply and implement them in practical work.

Second, strengthen the supervision and inspection to cataloging process. Libraries should set up special quality inspection departments or quality inspection posts, which are responsible for regular or irregular spot checks and comprehensive inspections of cataloging work to find out the problems and omissions in the cataloging process in time and urge catalogers to make rectification in time.

Third, establish cataloging quality feedback mechanism to improve cataloging quality continuously. Libraries should actively collect feedback and suggestions from readers to understand their satisfaction and needs to cataloging work. At the same time, modern technical methods, such as online survey and big data analysis, can be used to deeply analyze the readers' behaviors and preferences, so as to meet their needs more accurately.

Fourth, strengthen the training and education of catalogers. Libraries should regularly carry out training and education activities for catalogers, including professional knowledge lectures, skills training courses, business exchange seminars, etc. to help them continuously improve their professional quality and skill level.

3.3 Methods for Optimizing the Cataloging Process

Refine the cataloging process to remove redundant items and reduce unnecessary repetitive work. For example, by combining similar recording and indexing tasks, or optimizing the data input methods, cataloging efficiency can be effectively improved.

Actively introduce advanced cataloging technology and tools. For example, using natural language processing and machine learning technology, intelligent classifica-

tion system can automatically assign accurate classification labels to books, thus reduce the need of manual intervention.

Furthermore, strengthen the real-time monitoring and management of cataloging process. By establishing a perfect monitoring mechanism, the library can track the progress and quality of cataloging work in real time, and solve the bottleneck problems in the process in time. In addition, periodic process reviews and performance evaluations can ensure that the cataloging process remains on an efficient and accurate status at all times.

Establish a long-term mechanism for process optimization to continuously optimize cataloging work. Library should regularly evaluate the effectiveness of the existing cataloging process and optimize it according to the development of technology, the needs of readers and the development goals of the library itself.

4 Case Study-Cataloging Subsystem based on Interlib

Interlib, a library cluster management system, is a new generation of library automation software. Its major feature is a multi-library cluster management system based on B/S structure, which can realize regional union, coordinated procurement, joint cataloging, loan and return among branches. Interlib cataloging subsystem is so powerful that it can provides powerful support for cataloging process optimization and management[10].

4.1 Interlib Cataloging Subsystem Workflow

When the collection location and book type are set to the default value, the cataloger only needs to scan the barcode number after checking the bibliographic data to enter the interface of Interlib system. If there is an error, just click "Edit Acceptance" to modify it. After finishing a batch of books, as long as a new batch number is created, the new books can be catalogued. The books which have been completed will automatically be converted into the state of being in the library after the set time. This system can greatly shorten the time of book processing and improve the work efficiency.

4.2 Advantages of the Interlib Cataloging Subsystem[11]

Support data files sharing in multiple formats. In addition to receiving various standard MARC data, Interlib can also convert files in Excel, fixed-length text, dbf and other formats into MARC data through the conversion tools provided by the system, and then access to Interlib database. The data format of MARC data source file is composed of fields and sub-fields. Through format conversion, the corresponding relationships between fields and sub-fields can be set, and the data of the source files can be transferred to the library correctly. Interlib system also provides bookseller data receiving function, which can directly transfer the bibliographic data provided by booksellers to the central bibliographic database.

Flexible field generation function. Another major feature of Interlib system is that it supports automatic addition of text meaning in MARC field. Especially when Chinese and Western cataloging systems are used alternately, the fields are so similar that confusion often occurs. The automatic additions of these chinese characters can avoid the occurrence of this situation, then can save the catalogers' entry time and reduce errors.

Automatically generate related fields. For example, 210 $a and 210 $c fields can be automatically generated according to the subfield 010 $a; field 517 is automatically generated from the subfields $e and $i of field 200. According to the subfield $d of 210, the publication time is generated in field 100, etc.

Automatically generate call number. In Interlib system, bibliographic informations and library collection informations are stored separately, and the system assigns call numbers at the time of books acceptance. The system will automatically extract the classification number from the field 690, and automatically generate the type number when accepting and saving the call number.

Generate subject words and classification informations each other. In the process of book cataloging, the classification indexing and subject indexing of books are not easy things. In the process of cataloging with Interlib system, when the cataloger enters the subject word in the field 606 $a, and then types “Enter” in this field, the system will automatically generate the classification number-field 690 $a. If the subject words corresponded to multiple classification numbers are entered, the dialog box with multiple classification numbers will pop up for catalogers to choose which number is suitable. In the system parameter setting module, the functions of query, addition, modification and deletion of classification number-subject words are provided. Users can input the changes of classification and subject words into the system at any time, which is convenient for catalogers to use. These functions not only reduce the workload, but also help to realize the standardization of subject indexing and classification indexing.

Multi-language and multi-MARC format coexist. Interlib cataloging subsystem adopts Unicode standard, which really solves the problem of multi-language mixed coding. The subsystem can contain cataloging data of Chinese, English, Russian, Mongolian and other languages.

Convenient management function of attachments of books. Attachment is a new trend of book publishing. Interlib cataloging subsystem adds a simple cataloging function for attachments, and the attachment data are interlinked with the original data, so it is clear at a glance whether the books have attachments and can be borrowed.

Excel can be used. The main function of Excel is to deal with all kinds of data and charts. After the introduction of Excel into Interlib cataloging subsystem, the statistical speed is faster, and various forms of Excel tables can be printed. Moreover, when importing and exporting bibliographic data, Excel can also be used.

4.3 Analysis of Implementation Effect

Through in-depth and meticulous case research, we find that the cataloging quality has been significantly improved after adopting the cataloging management measures proposed in this paper and Interlib cataloging subsystem. Table 1 shows the comparisons before and after the optimization.

Table 1. Comparisons before and after the implementation of optimization measures. (number of book samples: 10,000)

Implementation effect / Test content	Before optimization	After optimization
Error rate of cataloging data	0.9%	0.01%
Omission rate of cataloging data	0.06%	0.001%
Cataloging data consistency	96%	100%
Cataloging efficiency	94%	99%

It can be seen from Table 1 that after optimization, the error rate and omission rate of data are significantly reduced, and the integrity and standardization of cataloging data are also significantly improved, which means that readers can obtain the required contents more accurately when retrieving and using the book information, thus greatly improving the service quality of the library. After optimization, the consistency of data and cataloging efficiency have also been significantly improved, which lays a foundation for cross-library borrowing and resource sharing, and also helps the new books to be put on shelves in time.

5 Conclusion

In terms of cataloging data quality management and process optimization, this study puts forward a series of specific measures. By simplifying cataloging process, introducing modern technology and tools, strengthening process monitoring, the efficiency, accuracy and consistency of cataloging work have been successfully improved. These optimization measures not only simplify the operation of catalogers, but also reduce the omission rate in the cataloging process, thus improving the overall service quality of the library.

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