Assessing Metadata Quality in AIIMS Rishikesh Library OPAC: A Detailed Analysis of Bibliographic Records

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ABSTRACT

This study aims to assess the quality of metadata within the AIIMS Rishikesh Library OPAC by conducting a detailed analysis of its bibliographic records. The researchers accessed the AIIMS library OPAC and identified 4,641 textbook records from February to October 2023, of which 4,183 were in English, representing 90% of the total. Data conversion was performed using MARCEdit Tools to transform bibliographic records into Excel format for ease of analysis. For a comprehensive understanding and to enhance data quality, a sample of 42 records was selected, with 21 of these also represented in the



Library of Congress (LOC) database and subsequently used for comparative analysis. The study meticulously scrutinized the catalogue records to detect errors, categorizing them into format, content, and editing/input errors. The analysis revealed a total of 526 errors across the 26 records, with the most prominent errors occurring in specific fields such as F3, E6, and C2. These errors included omitting subfield codes, missing full stops, and omitting parts of entries, respectively.

The findings highlighted significant discrepancies in the AIIMS Rishikesh catalogue records, emphasizing the need for improved data entry protocols and the implementation of automated error-checking software. The study provided several recommendations aimed at enhancing data quality, which is crucial for effective information retrieval. In conclusion, the analysis identified various areas for improvement in the metadata quality of the AIIMS Rishikesh OPAC. Addressing these issues can significantly improve data accuracy and reliability, thereby enhancing the overall quality of the library's information systems and aiding users in resource discovery and retrieval.

Keywords :

Data Quality, Catalogue Evaluation, Cataloguing Quality, Library of Congress, AIIMS Library, Metadata Quality, Online Public Access Catalogues (OPAC), Bibliographic Records, Accuracy in Cataloguing.

1. Introduction :

The quality of catalogue records is paramount in ensuring the accessibility of described resources, a concern that has attracted scholarly attention globally. Adherence to cataloguing standards is

critical for enhancing resource accessibility. Chandrappa and Harinarayana (2018c) emphasized that "quality of cataloguing refers to recording the details in the bibliographic record meticulously and comprehensively in conformance with the requirements as prescribed by the standards of cataloguing" (Avdoyan, 1995).

Deviations from these standards can hinder users' ability to locate relevant information efficiently, thereby violating Ranganathan's law of saving the time of the user (Abd Manaf & Abdul Rahman, 2006; Chandrappa & Harinarayana, 2018a). Inaccurate or incomplete records significantly affect information retrieval, underscoring the need for rigorous error detection and maintenance to ensure the integrity of library catalogues (Chandrappa & Harinarayana, 2018b).

The quality of library cataloguing records is often evaluated based on several criteria, including accuracy, completeness, consistency, and compliance with established standards such as the Resource Description and Access (RDA) and MARC 21 formats. Quality cataloguing ensures that each bibliographic record provides a precise and thorough description of an item, which includes correct author names, titles, publication details, and subject headings.

Errors in cataloguing can be broadly categorized into format errors, content errors, and editing/input errors. Format errors pertain to incorrect usage of cataloguing codes and structures. Content errors involve inaccuracies in the bibliographic details, such as incorrect author names or titles. Editing/input errors are mistakes made during the data entry process, which can range from typographical errors to incorrect field values. These errors can significantly impede users' ability to find and retrieve library materials effectively.



The importance of quality in cataloguing records cannot be overstated. High-quality cataloguing supports resource discovery, user satisfaction, and overall library efficiency. It ensures that users can reliably locate the resources they need, saving time and enhancing the user experience. Poor quality in cataloguing can lead to frustration, wasted time, and potentially the underutilization of valuable resources. It also affects the interoperability of library systems, making it difficult to share records between institutions and integrate with other information systems.

This study aims to evaluate the accuracy of bibliographic records by conducting a comparative analysis of catalogue records from the AIIMS Central Library OPAC and the Library of Congress (LOC). By identifying and categorizing errors, this research seeks to provide actionable insights for improving cataloguing practices and enhancing the overall quality of metadata records. Such improvements are vital for facilitating efficient information retrieval and supporting the broader goals of digital repositories in promoting global scholarly communication.

2. Literature Review :

The preference of users to search for information using subject rather than other online catalogue searches has been noted by scholars globally. This trend was highlighted in a study by Joseph, Gary, and Douglas (1983) referenced by Romero (1995), where 59% of searches in America were conducted by subject. Similarly, Frost (1987), cited by Romero (1995), found that 54% of students used their time to access information by subject. However, these findings contrast with a study by the Council on Library Resources, which reported that 43% of users encountered difficulty using the correct subject term and 31% were dissatisfied with using subjects to access relevant information in online catalogues (Romero, 1995).

Central to library functions is ensuring the accuracy of catalogue records to assist users in accessing information with minimal effort and time. Chandrappa and Harinarayana (2018a) emphasize the quality of catalogue records, highlighting the importance of accuracy. In literature, accuracy is often discussed in terms of intellectual, mechanical, and minimal accuracy (Chandrappa & Harinarayana, 2018b). Although strict adherence to standards does not guarantee accuracy, it mitigates many challenges in retrieving information from online catalogues (Chandrappa &Harinarayana, 2018b; Hider & Tan, 2008; Graham, 1990). Quality is generally defined as conforming to standards (Suarez, 1992), measured by the readiness to provide access to information resources, which benefits users (Morris, 1995). Consistency in bibliographic records ensures that contemporary and future users can access information resources with minimal effort.

Errors, whether minor or major, can significantly impede access (Avdoyan, 1995; Chandrappa & Harinarayana, 2016). Fairclough (2013) noted that even minor errors, such as inconsistent application of headings in keyword searches, could prevent users from accessing relevant information. Typographical errors, considered minor, can significantly hinder the discovery process and prevent users from accessing relevant information (Kumar & Maurya, 2022; Fairclough, 2013). Therefore, there are no minor errors in online searching, as even small mistakes can necessitate the use of "did you mean?" messages in web-form searches (Fairclough, 2013).

Metadata quality encompasses dimensions such as completeness, accuracy, consistency, accessibility, conformance, provenance, and timeliness. A scoping review by Kumar, Chandrappa, and Harinarayana (2024) evaluated 55 studies using the PRISMA model and VOSviewer for co-occurrence analysis, identifying these dimensions as critical for



metadata quality assessment. However, there is no consensus on their exact definitions and measurements, indicating a need for further research into less commonly assessed dimensions.

The literature reveals that digital repositories and open government data are the most frequently studied data sources. The United States emerges as the leading contributor to metadata quality assessment research, with journal articles being the predominant document type used to communicate findings.

Chandrappa, Vasantha Raju, and Harinarayana (2021) investigated the implementation of MARC21 control fields in university library OPACs in Karnataka. Their study of 1,088 randomly selected records from nine university libraries found that control fields, particularly 001 and 003, were underutilized, adversely affecting data retrieval.

They recommended that libraries should prioritize filling in control fields during cataloguing. Chandrappa, and Harinarayana (2021, 2018a, 2018b, 2016) conducted multiple studies assessing the quality of catalogue records in various Indian universities and management institutes. These studies consistently highlighted the high error rates in Indian libraries compared to the Library of Congress (LoC).

They underscored the importance of accuracy, consistency, and adherence to standards in cataloguing practices (Boruah, Ravikumar, & Lamin Gayang, 2023). Zakaria (2023) measured typographical errors in the Egyptian Universities Libraries Consortium (EULC) using Ballard's typographical error terms list.

The study found a high mean error rate of 11.24 per record, emphasizing the need for stringent quality control measures to improve information retrieval systems. Schultz-Jones and Snow (2012) traced the evolution

of cataloguing quality from early library science literature to current debates. They highlighted the shift from rigid standards to a more flexible approach that aligns with user needs for find ability in next-generation catalogues.

This study aims to identify and categorize errors in the AIIMS Central Library OPAC's bibliographic records, compare their accuracy with the Library of Congress (LOC), quantify the frequency and severity of these errors, and analyze their impact on information retrieval efficiency.

3. Methodology :

This study employed a systematic approach to assess the quality of bibliographic records in the AIIMS Central Library OPAC using Koha Library software. The process included the following steps:

• **Data Collection:** The online public access catalogue (OPAC) of the AIIMS Central Library was accessed to retrieve 4,641 textbook records from February to October 2023, with a focus on 4,183 English-language records, comprising 90% of the total. Textbooks catalogued between 2010 and 2022 were selected for error analysis to provide a representative sample of recent records.

• **Data Conversion and Analysis:** Bibliographic records were converted from MARC to Excel format using MARCEdit Tools, facilitating easier data manipulation. A sample of 42 records was selected for comparison with the Library of Congress (LOC) catalogue using author name, title, and ISBN search methods, resulting in 21 successfully retrieved LOC records.

• **Error Categorization:** The records were meticulously scrutinized to identify errors, categorized into format, content, and editing/input



Table 1
Distribution and Categorization of Cataloguing Errors

Tag	Format Errors	Content Errors	Editing/Input Errors	Total Errors	Percentage
020	0	0	0	0	0
082	21	21	21	63	14.45
100	27	3	24	54	12.39
245	41	7	31	79	18.12
246	1	3	0	4	0.92
250	0	21	21	42	9.63
260	18	0	63	81	18.58
264	0	0	0	0	0.00
300	0	26	42	68	15.60
490	0	1	0	1	0.23
700	19	15	9	43	9.86
730	0	1	0	1	0.23
Total	**127**	**98**	**211**	**436**	**100**

errors. A weighting scheme based on Zeng (1992) was applied to quantify the impact of each error type on information retrieval accuracy.

4. Data Analysis and Interpretation :

The study involved analyzing cataloguing quality errors in the records from AIIMS Rishikesh and the Library of Congress (LOC) to identify discrepancies and assess overall cataloguing quality. The results are detailed in the following tables and interpretations:

Table 1 presents a detailed analysis of cataloguing errors identified in the AIIMS Rishikesh Library OPAC, revealing significant discrepancies across various bibliographic fields. The most frequent errors were found in author entries (100, 700), accounting for 22.25% of all errors, followed by title statements (245, 246) with 19.04%, and publication

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Table 2
Errors identified in LOC Records

Tag	Format Errors	Content Errors	Editing/Input Errors	Total Errors	Percentage
020	0	0	0	0	0
082	0	2	19	21	23.33
100	0	2	5	7	7.78
245	0	3	21	24	26.67
246	0	0	1	1	1.11
250	0	2	0	2	2.22
260	0	0	16	16	17.78
264	0	0	5	5	5.56
300	0	0	3	3	3.33
490	0	0	0	0	0.00
700	0	1	10	11	12.22
730	0	0	0	0	0.00
Total	**0**	**10**	**80**	**90**	**100.00**

details (260) with 18.58%. The analysis categorized errors into Format Errors (127 instances, 29.13%), Content Errors (98 instances, 22.48%), and Editing/Input Errors (211 instances, 48.39%).

The high prevalence of editing/input errors suggests a critical need for enhanced data entry protocols and the adoption of automated error-checking software to minimize human error. Addressing these issues is vital for improving the accuracy and reliability of catalogue records, thereby enhancing users' ability to efficiently discover and retrieve resources.

Table 2 shows the prevalence of editing/input errors is notably high, accounting for 80 out of the total 90 errors (88.89%). This suggests a



Table 3
Error Points and Error Score

Name of Library	Number of Records	Number of error Points	Number of error Score	Percentage of error Points (N=526)	Percentage of error Score (N=899)
AIIMS Rishikesh	21	436	788	82.89	88.74
LOC	21	90	100	17.11	11.26
Total	**42**	**526**	**888**	**100.00**	**100.00**

need for enhanced data entry protocols and the possible implementation of automated error-checking software to reduce human error.

Content errors make up 10 errors (11.11%), while no format errors were identified.

The reviewed tags include those associated with classification numbers (082) with 23.33% of errors, title statements (245, 246) with 27.78%, edition statements (250) with 2.22%, publication details (260) with 17.78%, physical descriptions (300) with 3.33%, and author entries (100, 700) with 20.00%, among others.

Table 3 presents the relative error rates revealed in the AIIMS Rishikesh and Library of Congress catalogue records. The overall error points per record were found to be 12.52, and the error score was 21.14. A catalogue record with an error score above 5 is considered to lack quality.

AIIMS Rishikesh accounts for 82.89% of the total error points and 88.74% of the total error scores, while LOC accounts for only 17.11% of the error points and 11.26% of the error scores. The high error



Table 4
Error in the Catalogue Records of AIIMS, Rishikesh and Library of Congress

Name of the University	Format error	Content error	Edit & input errors	Total	%
AIIMS Rishikesh	127	98	211	436	82.89
LOC	0	10	80	90	17.11
Total	127	108	281	526	100
Percentage	24.14	20.53	55.32	100	
Total	**42**	**526**	**888**	**100.00**	**100.00**

score (21.14) for AIIMS Rishikesh indicates that their records are well beyond the acceptable threshold, pointing to serious quality issues.

The analysis clearly shows that AIIMS Rishikesh's library catalogue records suffer from a high incidence and severity of errors, significantly more than the LOC. This finding underscores the necessity for urgent remedial action to improve cataloguing quality. Enhanced training for cataloguers, adoption of better cataloguing tools, and periodic reviews could help address these issues and bring the quality of records to an acceptable standard.

Table 5
Error Occurrences of the AIIMS and LOC

Fields	AIIMS Rishikesh	LOC	Total Errors	Percentage
020	0	0	0	0.00
082	63	21	84	15.97
100	54	7	61	11.60
245	79	24	103	19.58
250	42	2	44	8.37

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260	81	16	97	18.44
246	4	1	5	0.95
264	0	5	5	0.95
300	68	3	71	13.50
490	1	0	1	0.19
700	43	11	54	10.27
730	1	0	1	0.19
Total	**436**	**90**	**526**	**100.00**

Table 4 demonstrates the distribution of errors by their types. The 'edit & input' errors constitute the majority at 55.32%, while format and content errors together represent 44.68% of the total errors. In other words, the catalogue records of both libraries exhibited 55% major errors and 45% minor errors. AIIMS Rishikesh (82.89%) and LOC (17.11%) contribute significantly to the total errors. This analysis underscores the need for focused efforts to reduce 'edit & input' errors, which are the predominant type of errors. Improving data entry processes, providing better training for cataloguers, and implementing more rigorous quality control measures can help reduce these errors and enhance the overall quality of catalogue records.

The overall field-wise distribution of errors in Table 5 shows that fields 245 and 260 contain the highest number of errors, accounting for 19.58% and 18.44% of the total errors, respectively. These fields are crucial as field 245 includes the title statement in MARC21, which consists of the title, remainder of the title, and statement of responsibility. The high incidence of errors in field 245, especially at AIIMS Rishikesh, highlights the need for cataloguers in academic libraries to be more meticulous in recording these details to reduce errors.

Table 6
Catalogue Recordwise Errors

Record	AIIMS Rishikesh	Percentage	LOC	Percentage
REC_01	24	5.50	4	4.44
REC_02	18	4.13	3	3.33
REC_03	20	4.59	4	4.44
REC_05	22	5.05	4	4.44
REC_06	20	4.59	4	4.44
REC_08	23	5.28	4	4.44
REC_09	16	3.67	3	3.33
REC_10	20	4.59	3	3.33
REC_11	19	4.36	4	4.44
REC_12	21	4.82	6	6.67
REC_14	23	5.28	5	5.56
REC_15	21	4.82	3	3.33
REC_16	19	4.36	3	3.33
REC_17	19	4.36	5	5.56
REC_20	25	5.73	5	5.56
REC_21	20	4.59	4	4.44
REC_25	27	6.19	6	6.67
REC_26	22	5.05	7	7.78
REC_32	22	5.05	4	4.44
REC_39	16	3.67	3	3.33
REC_40	19	4.36	6	6.67
Total	**436**	**100**	**90**	**100**

Field 260, which records the details of the place, publisher, and date of publication, ranks second in the number of errors, with 18.44% of the total errors. Accurate information in this field is vital for users of the catalogue, and errors can significantly hamper the usefulness of the data.

Fields 100, 700, and 730 together represent access points related to the creator of the resource and account for 22.06% of the total errors. Ensuring accuracy in these fields is essential for proper attribution and retrieval of records. The findings indicate that cataloguers need to focus on improving accuracy in these critical fields to enhance the overall quality and usability of the catalogue records.

Table 6 presents the distribution of errors across individual catalogue records shows that AIIMS Rishikesh exhibits a higher frequency and severity of errors compared to LOC. AIIMS Rishikesh records range from 16 (3.67%) to 27 (6.19%) errors per record, whereas LOC records range from 3 (3.33%) to 7 (7.78%) errors per record.

This variance in error occurrences suggests inconsistent cataloguing practices at AIIMS Rishikesh. REC_25 at AIIMS Rishikesh has the highest number of errors (27 errors, 6.19%), while REC_26 at LOC has the highest (7 errors, 7.78%). REC_09 and REC_39 at AIIMS Rishikesh have the lowest number of errors (16 errors, 3.67% each), and several records at LOC (REC_02, REC_09, REC_10, REC_15, REC_16, REC_39) share the lowest number (3 errors, 3.33% each).

5. Recommendations:

Based on the findings of this study, several recommendations are proposed to enhance the quality of bibliographic records in the AIIMS Central Library OPAC:

1) *Standardized Formatting Guidelines:* Implement standardized formatting guidelines to ensure consistent application of cataloguing codes and conventions. This will help reduce format errors and improve the overall accuracy of bibliographic records.



2) *Thorough Verification of Content Details:* Establish protocols for thorough verification of bibliographic details, including author names, titles, publication details, and subject headings. This will help mitigate content errors and ensure the accuracy of cataloguing records.

3) *Automated Error-Checking Mechanisms:* Develop and implement automated error-checking mechanisms to identify and correct typographical errors, misspellings, and incorrect field values during the data entry process. This will help reduce editing/input errors and improve the efficiency of the cataloguing system.

4) Regular Training for Cataloguers: Provide regular training for cataloguers on best practices in bibliographic data management and the use of cataloguing tools. This will help ensure that cataloguers are equipped with the necessary skills and knowledge to maintain high standards of accuracy and consistency in their work.

5) Comparative Analysis with LOC: Conduct regular comparative analyses with the LOC records to identify discrepancies and areas for improvement. This will help maintain high standards of quality control and ensure that the AIIMS Central Library OPAC records are aligned with best practices in bibliographic data management.

6) Ongoing Quality Control Measures: Implement ongoing quality control measures to regularly review and update bibliographic records. This will help identify and correct errors, ensuring that the catalogue system remains accurate and reliable over time.



By implementing these recommendations, the AIIMS Central Library can enhance the quality of its bibliographic records, improving the accuracy and efficiency of its catalogue system and providing better support for information retrieval and academic research.

6. Conclusion :

This study aimed to analyze the errors in bibliographic records in the AIIMS Central Library OPAC, focusing on format, content, and editing/ input errors. The findings revealed a significant number of errors, with format errors being the most prevalent, followed by content and editing/ input errors. The comparative analysis with LOC records highlighted a higher error rate in the AIIMS Central Library OPAC, underscoring the need for improved data entry protocols and quality control measures.

The recommendations proposed in this study, including the implementation of standardized formatting guidelines, thorough verification of content details, automated error-checking mechanisms, regular training for cataloguers, comparative analyses with LOC, and ongoing quality control measures, are aimed at enhancing the quality of bibliographic records in the AIIMS Central Library OPAC. By adopting these recommendations, the AIIMS Central Library can improve the accuracy and efficiency of its catalogue system, providing better support for information retrieval and academic research. The findings from this study offer valuable insights into the current cataloguing practices and suggest actionable steps for enhancing the quality of bibliographic data management in the library.

While this study provides valuable insights into the errors in bibliographic records in the AIIMS Central Library OPAC, it is important to acknowledge its limitations. The sample size of 21 records,

although sufficient for identifying common errors, may not capture all possible variations and issues in the entire catalogue. Future research with larger sample sizes and more diverse records is recommended to obtain a more comprehensive understanding of the cataloguing practices in the library.

Future research could focus on a longitudinal analysis of bibliographic records to track changes and improvements over time. Additionally, exploring the impact of specific training programs and automated error-checking tools on the quality of cataloguing records could provide further insights into effective strategies for enhancing bibliographic data management. In conclusion, maintaining high standards of accuracy and consistency in cataloguing practices is crucial for ensuring the reliability and effectiveness of library catalogue systems. This study contributes to the ongoing efforts to improve bibliographic data management and provides a foundation for future research in this area. By addressing these limitations and pursuing future research avenues, the AIIMS Central Library can continue to improve its cataloguing practices and ensure the highest standards of accuracy and reliability in its bibliographic records.



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