International Journal of Research in Library Science (IJRLS)

ISSN: 2455-104X

DOI: 10.26761/IJRLS.11.4.2025.1965

Volume 11, Issue 4 (October-December) 2025, Page: 438-449, Paper ID: IJRLS-1965

Clean Imports, Standardized Catalogues: Fixing Frameworks and customizing MARC Structures for data rectification and data quality in Koha ILMS Environment

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ABSTRACT

Data migration is a necessity for libraries transitioning to Koha. It is a crucial step that seamlessly integrates all the bibliographic and transactional data a library has into an open-source Integrated Library Management System (ILMS). While migrating data, catalog records, user details, and transaction histories, among other things, are all transferred to Koha's ILMS. Since this is an automated process, it reduces the chances of errors being made manually and, at the same time, maintains data integrity. Thus, libraries can effectively utilise the advanced features of Koha. Without a doubt, data migration is a challenging task; however, it also presents an opportunity to address current issues and reorganize the library workflow. The paper reveals the library database as a place where data rectification was not only done but also was vital. There are quite a few library system upgrades during which a multitude of rectifications and enrichments of the catalogue can be performed. The paper sheds light on data rectification in Koha software, providing the reader with insight into this process. This paper highlights the challenges encountered during switch or data migration operations. Additionally, it addresses the issues in the library catalogue, the challenges and opportunities of data migration, and the various steps required during the data rectification process.

KEYWORDS: Open-Source Software; KOHA, Library Management Software; Data Migration; Data Rectification.

INTRODUCTION

Koha is an Integrated Library Management System (ILMS) with extensive features that runs on the internet, and it uses SQL databases for its data storage. The SQL databases are often installed on a MySQL server. All cataloging data within Koha is stored in MARC format, and provides standard methods of access for users of the library, using Z39.50 and SRU protocols. One of the main benefits of the Koha design is that it allows library staff to create their own custom reports, either using the report wizard that comes with Koha or by directly writing the SQL statements to produce those reports. Data rectification in Koha involves identifying inaccuracies in the Koha database (e.g., incorrect spelling of author names or missing publication dates) and correcting those errors in the database. Since regular inspections of the library's data will reveal any errors, this process is very important to maintaining the integrity of the library's data. Accurate data is an integral component for providing timely and accurate library services, including catalog discovery, circulation, and reports.

Why Data Rectification is Necessary

Improved Data Quality:

The advantages of data rectification include ensuring that the data provided to library users regarding their search data is accurate, thereby improving their experience and workflows. The key to providing services in libraries is having trustworthy bibliographic information. The libraries are in a position to guarantee, through data rectification, that their information about various constituents, including resources, materials, and users, is accurate and correct. The various information that has the right character forms the central part of search outcomes, statistics, and reports provided by the libraries.

Data Migration Processes and Tools

Migration of Koha itself is a correction process that involves multiple tools to migrate, clean, and then verify the migrated data from the legacy system before migrating the existing Koha database. In fact, many research papers have discussed the process and the issues faced when migrating bibliographic records from one software package to another. This migration process is elaborated upon by Chakravarty et al. (n.d), who discuss retrofitting data conversion software MarcEdit, thereby allowing for the proper integration of MARC. Todd et al. (2018) & Msonde et al. (2025) further explained the process definition and process change in procedures as systems converted from Millennium & ADLIB to Koha. There is one research paper by Sotiriadou et al. (2016) & Mishra et al. (2015) that explains a case study of migration from the Horizon system to the Koha environment, describing both technical and resolution techniques. They also discussed in their paper about IIT Roorkee, depicting the proposed process of migration along with resolution techniques.

Performance, Tuning, and System Optimization

Enhancing, optimizing, modifying, and correcting the Koha system optimizes performance in view of the challenges posed by the data, thereby improving operational efficiency. From this rationalization, it is essential that the process of optimizing the Koha System occurs after the completion of the migration process. The techniques applied to optimize the performance of the Koha System are clearly discussed (Abu Kousar, 2024). All steps taken to decrease performance bottlenecks in the process are outlined in the paper.

Metadata and Record Rectification

By updating, repairing, and standardizing bibliographic records' information, Koha Correction enables proper management of library collections. Without a doubt, collection management forms the basis of a given library system; therefore, Koha Correction is one of the most important processes in Koha. It was shown by Mulay et al. (2019) and Pund & Jain (2016) that libraries commonly have multiple copies of a particular title. They came up with a method for eliminating duplicated bibliographic records from Koha and mapped the Libsys to Koha data structure.

Customization and user interfaces

The practice of Koha Correction involves implementing modifications to the Koha applications and user interface to make it easier for librarians to teach patrons how to use the system and meet the unique requirements of libraries, such as assisting their various patron groups. Shaik Savali and Madhuri (2024) customized the Web and OPAC interfaces for the ICAR library, highlighting the need to modify the library interface and other aspects of the user experience. Khatun and Ahmad (2018) conducted a usability test of the Koha OPAC, while Amirah et al. (2023) evaluated the cataloguing module of a Malaysian academic library through a survey. Both studies highlighted Koha's strengths and weaknesses.

Institutional Experience and Case Studies.

Many libraries have shared their experiences with implementing Koha, with varying levels of focus on performing specific data cleaning activities, which have resulted in a higher degree of cataloging accuracy and greater efficiency in their cataloging efforts compared to others. The positive changes resulting from this improved efficiency will lead to an enhanced user experience. In addition to the experience of institutional implementation, a growing body of research has developed various strategies and techniques to facilitate the cataloging of library materials and provide easier access to them. Bwalya and Akakandelwa (2021) discussed the challenges of library usage in the academic setting of Zambia and elaborated on the climate of the difficulties, while Olowoporokuetal (2024) engaged in the evaluation and assessment of user experience, and Karno et al. (2021) recorded the journey of Universiti Teknologi Malaysia in the development and implementation of Koha.

Tools and Utilities for Koha Rectification

Numerous practical studies and reports have provided insights into the utilities required for interface optimization and data migration. Furthermore, various aspects of the puzzle, such as the internal experiences of the institutions and contributions, have also been significantly focused on the technical side of the Koha development. For eg, standard tools are given below

MARC Editing and Metadata Correction:

Machine-readable cataloging editing tools play a significant role in managing, organizing, unifying, and transferring bibliographic records of libraries. These tools are essential for handling library records. When paired with scripts and plugins, these tools become a powerful means of handling library records, standardizing fields to facilitate easier access, and fixing metadata inconsistency issues in the information contained. Nyambaka & Mutwiri (2025) highlight in their study that the usability of Koha's MARC editing utilities and metadata cleanup scripts has a great impact on the correctness of information retrieval.

Interface and OPAC Customization

Plugins are enhancements that help improve Koha's user interface, advanced search filters, language support, and accessibility settings. Few user satisfaction surveys and studies (Olowoporoku et al., 2024; Nyambaka & Mutwiri, 2025) have shown that improvements and rectification usually involve OPAC customization. Plugins that improve advanced search filters, language support, and accessibility features help tailor and align Koha to the needs of local communities.

Analysis and Reporting Modules

To analyze the records available in KOHA is easy, and one can make the necessary corrections in one go. Also, any library professional can generate the desired reports from anywhere. Koha's SQL-based utilities generate error reports, track cataloging performance, and monitor system usage to provide insights for assessment and improvement. Several studies of libraries in South America (Leiva et al., 2024) and Europe (Poley et al., 2025) highlight the role of Koha's reporting utilities in cataloging. The SQL-based reporting module helps detect errors. This also supports monitoring classification consistency and generating performance audits.

AI and script-based error detection

New experimental methods have resulted from the development and use of artificial intelligence. This leads to situations in which machine learning or rule-based scripts are used to locate issues in cataloguing records, thereby lessening the librarians' workload. AI-driven approaches are becoming popular in Nigerian as well as European research environments (Ogungbenro et al., 2025; Poley et al.,2025). These comprise the machine learning tools integrated with Koha to identify metadata irregularities, perform automatic subject classification, and alleviate cataloguing staff from monotonous tasks.

The libraries that use Koha frequently disseminate the solutions and correction tools they have developed among Koha user groups and developer communities, so that they can be widely adopted at the local and institutional levels. These instruments demonstrate how the open-source ecosystem of Koha facilitates community-driven innovation. Several research works have acknowledged the role of the open-source nature of Koha in providing the flexibility that libraries worldwide have for the development, sharing, and adaptation of rectification tools. Such changes are proving to be the means that assist in balancing, at the same time, the technical fixes and user-centered improvements.

Efficient Operations:

The library's internal environment works on data that is often incorrect due to erroneous data. To create an efficient library environment and provide efficient library services, it is necessary to follow accurate data, especially in KOHA.

Compliance with Standards:

Libraries are required to comply with specific data standards and regulations, particularly when sharing information with other organizations. Data correction is the backbone of such obligations.

Reporting and Analysis:

To obtain informative reports, data must be accurate and correct. An analysis based on accurate data and reports is reported. Valuable information and insights can be generated upon examining different factors within and related to the library itself. This includes usage patterns and improvements that need to be implemented. Additionally, it would cover different key components involved in libraries.

Process of Data Rectification in Koha

- **Error Identification**: By assessing the reports, it is possible to identify the errors that indicate how the problem arises due to the data. Additionally, there is feedback for the users to allow them to point out the errors. Conducting an audit is crucial in identifying errors within the data.
- **Reviewing and Validation**: Potentially incorrect data moves to the review and validation stage. These stages are crucial in verifying the data. It may also be helpful to verify the data through another source.
- **Rectification of Data**: Once confirmed, the wrong data can be fixed with the help of Koha's instruments.

Besides, various modules must be considered. For instance:

- The Cataloging module is the place one goes to if one wants to fix the library records. The library staff can research various fields, including titles, authors, ISBNs, and other relevant areas.
- If there is a patron information issue, the patron management module will be the one to solve this problem.
- The circulation module is the one that has been employed in the completion of the check-in and check-out record data. Other details, such as due dates and circulation-related data, have also been corrected.
- The acquisitions module is the place where library staff can fix purchase orders, invoices, and other acquisition-related data.
- Recording changes is crucial not only for future use and the staff but also for auditing purposes.

Once data has been corrected, it is equally important to verify the modifications. This is to ensure that new errors are not created by the changes already made. In the daily life of a library, data correction is an ongoing process in Koha. Maintaining data quality is essential. Data correction is the key to the proper functioning of the system.

Data rectification of accession numbers

In Koha, rectifying data for inventory numbers typically involves modifying the items table using SQL queries. Typical tasks include adding or removing leading zeros, changing the length of the inventory number, i.e., accession number, or adding prefixes/suffixes. For example, to make all accession numbers six digits long by adding leading zeros, the `lpad` function is used in an UPDATE statement. To remove leading zeros, the `trim` function can be used.

To implement the modifications, the following procedure can be followed:

Backing up the database

It is always necessary to create a backup copy of the Koha database before making any changes.

Accessing the MySQL command line:

To gain access to the MySQL command line, where SQL queries are executed, users must log in using a root account.

Selecting the Koha Database

Use the Koha_library command (replace Koha_library with the actual Koha instance name) to specify the correct database.

Executing the SQL query

Use the UPDATE statement with appropriate functions such as lpad, Trim, or CONCAT to modify the barcode column (often used for accession numbers).

Verification of the Changes:

After executing the query, it is required to check the Items table. This step is needed to update accession numbers according to library standards.

Specific examples are provided, such as adding leading zeros.

CODE

UPDATE items SET barcode=lpad(barcode, 6, '0');

This query is needed to support the barcode field with leading zeros, making it six digits long and removing leading zeros.

CODE

UPDATE items SET barcode=trim (LEADING '0'F ROM barcode);

This query will remove all leading zeros from the barcode field by adding a prefix to it.

CODE

UPDATE items SET barcode= CONCAT ('GEN', barcode);

This query will add the prefix "GEN" to all accession numbers. Removing a prefix. Code

UPDATE items SET barcode=trim (LEADING' GEN ' FROM barcode); This query will remove the prefix "GEN" from all accession numbers.

It is significant to replace the example values with the specific requirements. Library staff may need to combine these codes or use more advanced SQL features for complex data rectification tasks.

Significance of the Accession Number in KOHA

In Koha, the accession number refers to a single copy of a physical item (for example, a book) in a library's collection and is an essential distinguishing feature. The simple bibliographic record, which consists of the title, author, and so on, is insufficient when a library has multiple copies of the same material; hence, the accession number is intended to identify and track those individual copies.

The value of the accession number is well reflected through these points:

- **Unique Identification:** The library can follow a specific copy's location, its circulation history, and other details by means of that physical copy's unique accession number.
- **Part of the Item Record**: In Koha, the item record carries the accession number and is different from the bibliographic record, which holds the information about the book (title, author, etc.).
- **Circulation and Management**: The act of interchanging the accession number is indispensable for the issuing of procedures like checkouts, check-ins, and renewals. In this way, the library knows which patron has which copy.

- **Reporting**: Accession numbers are used in various reports, such as inventory, circulation statistics, and overdue items.
- **Not a Standard MARC Field**: While the accession number is essential for library operations, it is not a standard field in the MARC (Machine-Readable Cataloging) format used to store bibliographic information. Instead, Koha often uses the 942$c for the type of document.
- **Customization**: Libraries can customize how accession numbers are generated and displayed in Koha, sometimes using authorized values or custom fields to manage and report on different collections or departments.

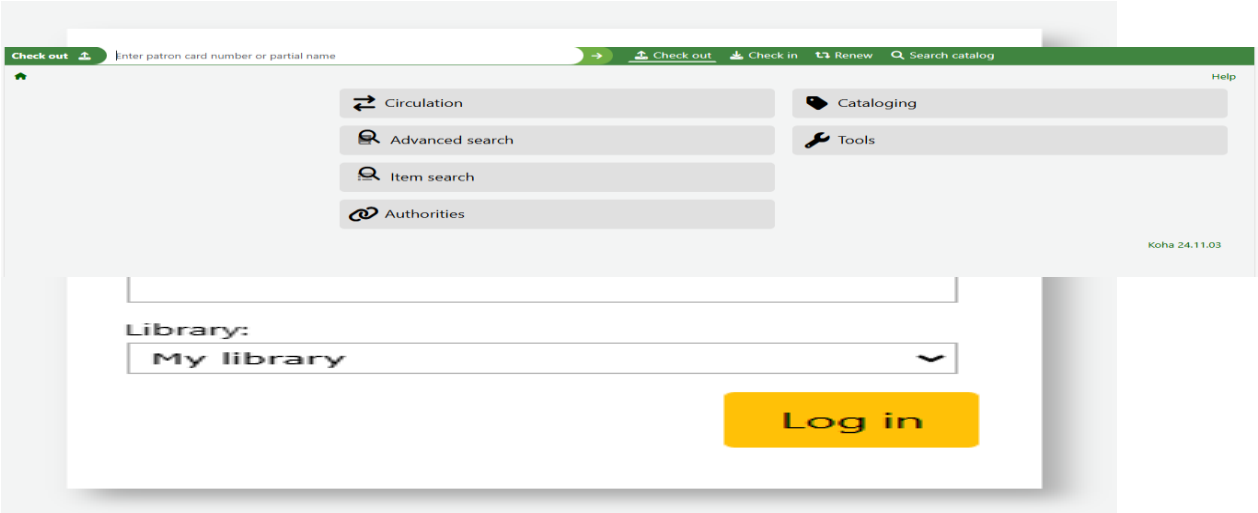
➢ **Cataloging-Koha**

New500=‡a Edited with Rancor. Creates a new 500 with a‡ a subfield and sets it to "Edited with Rancor"—245c= by J.K. Rowling. Set...

➢ **Customize Koha Accession Register**

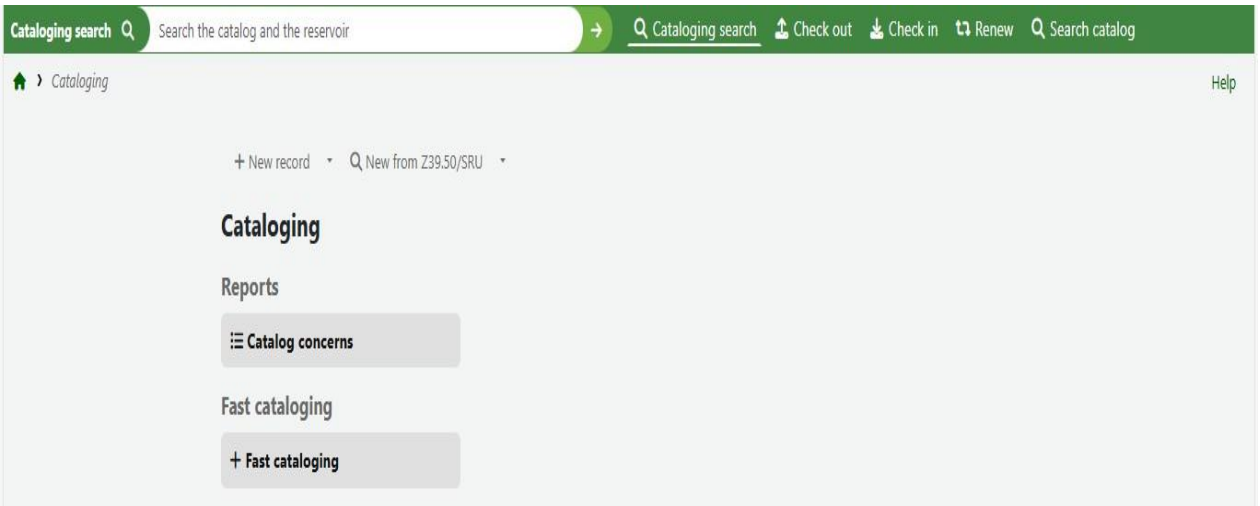
Screenshots from the Koha Environment

KOHA Login Interface:

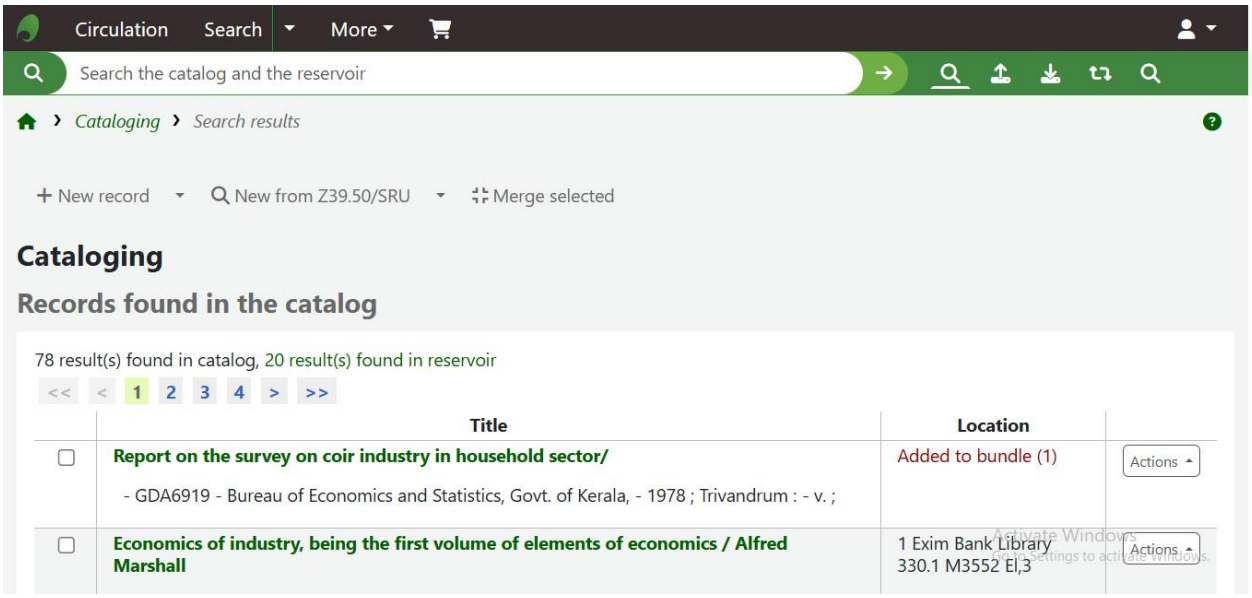


After Login Interface:

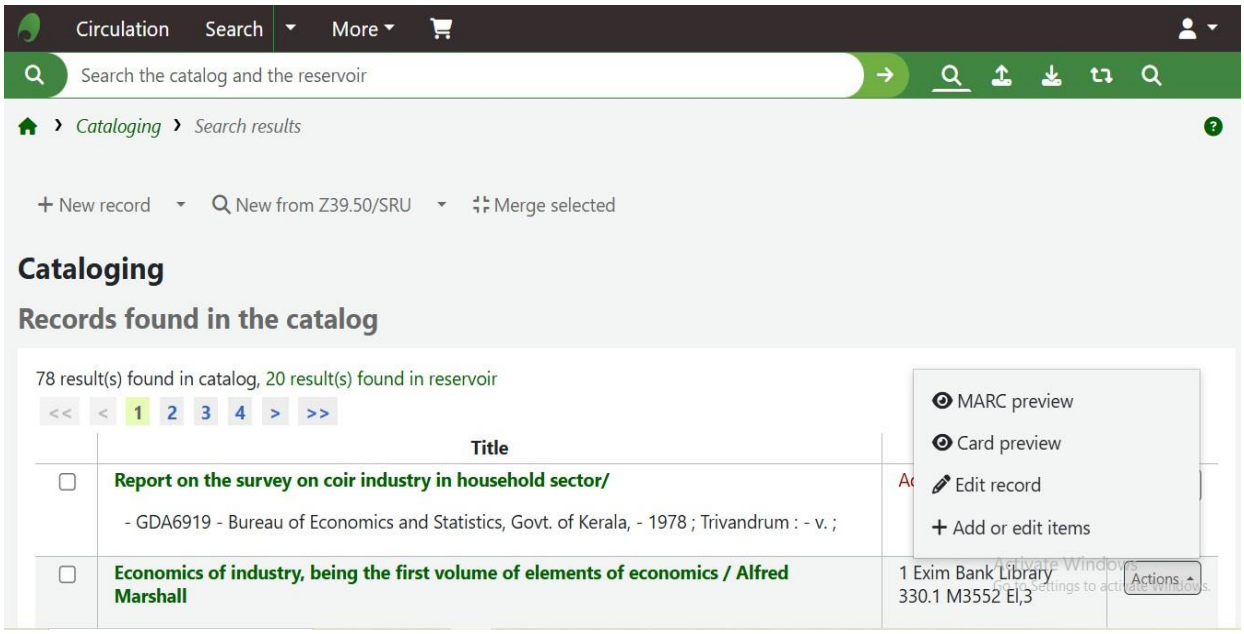
After entering the Cataloguing module of KOHA:



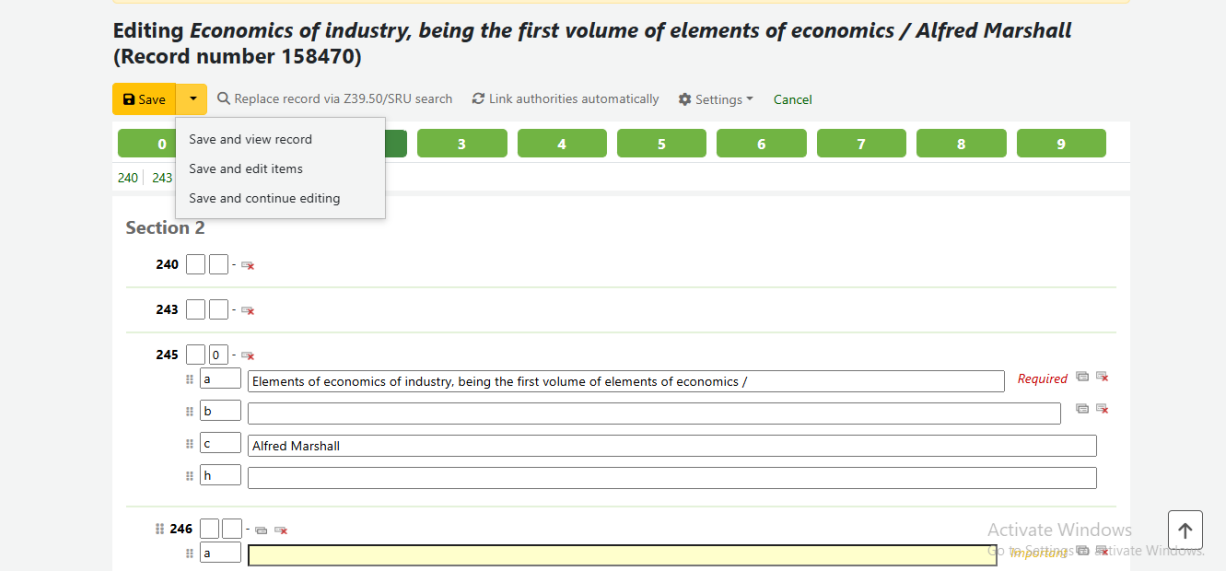
Given the search titled Economics of industry:



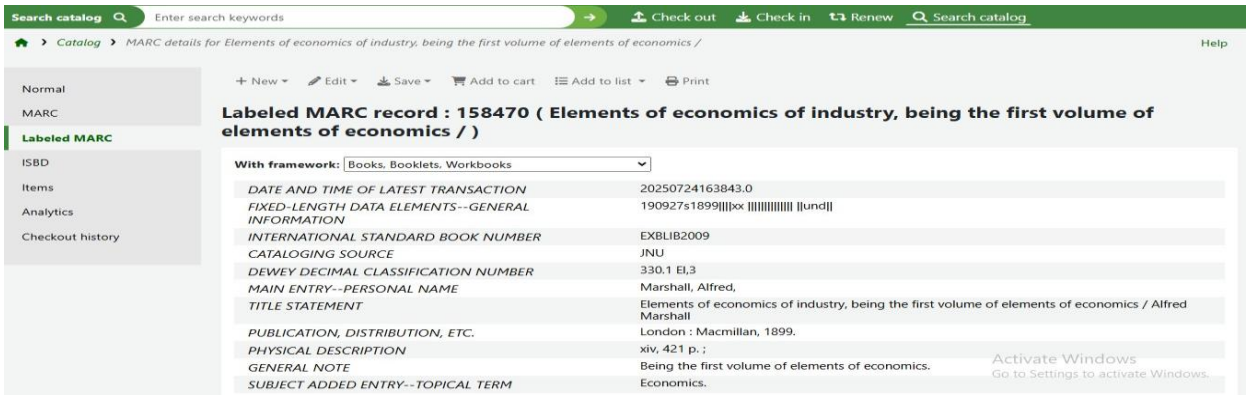
After that, click on the actions and edit the record.



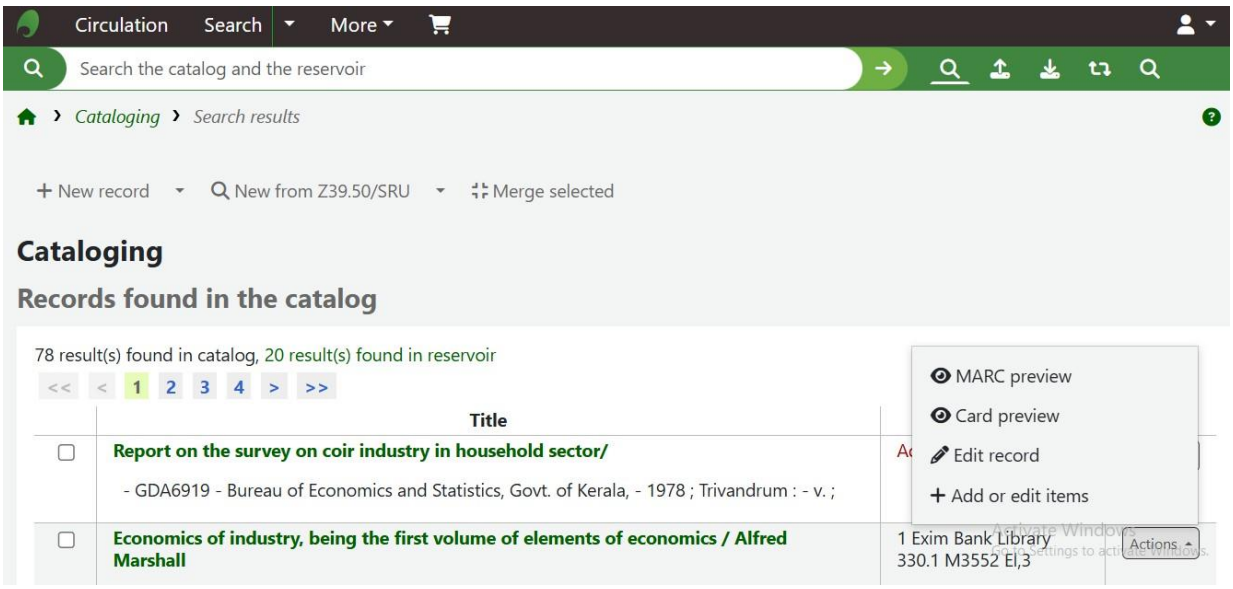
It requires correcting 245 fields, saving, and then viewing the record. The original title is Elements of Economics of Industry:



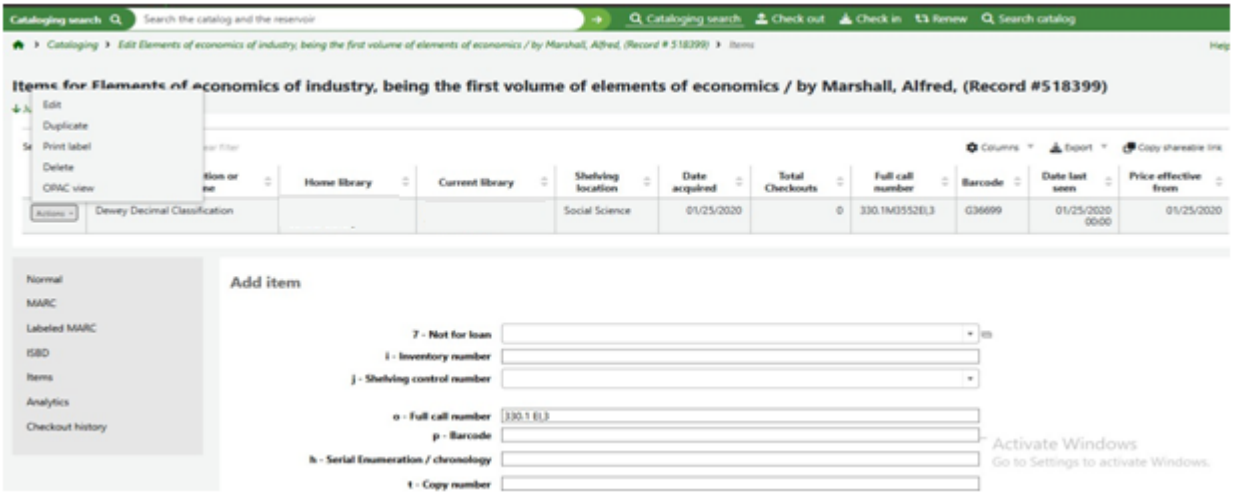
After saving the record, the title Elements of Economics of Industry is updated and viewed.



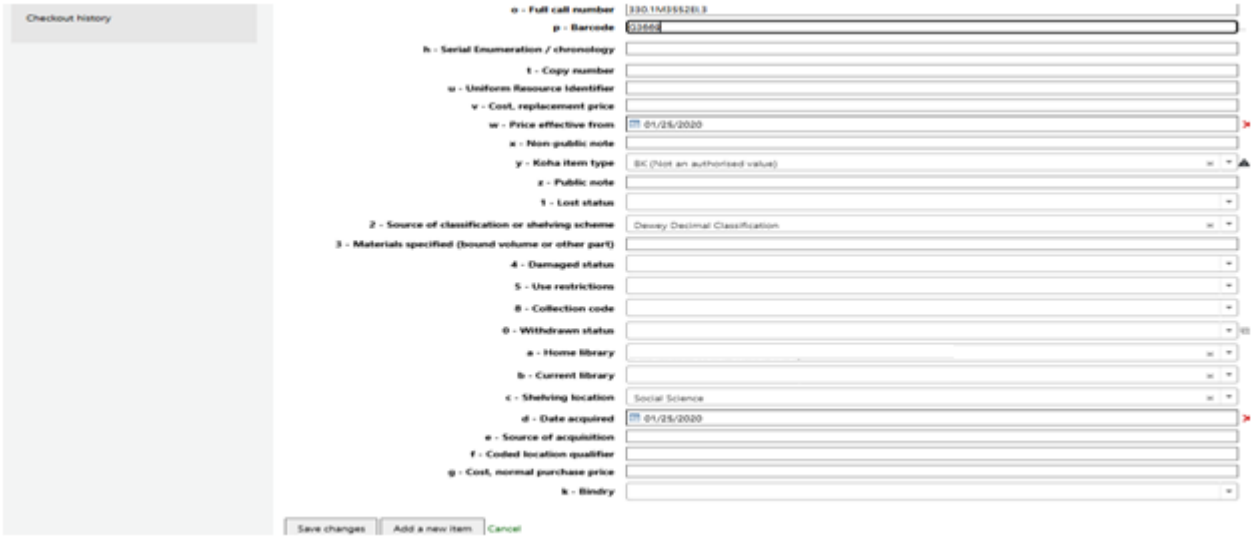
For Correction in ITEM, click on the ADD or edit items:



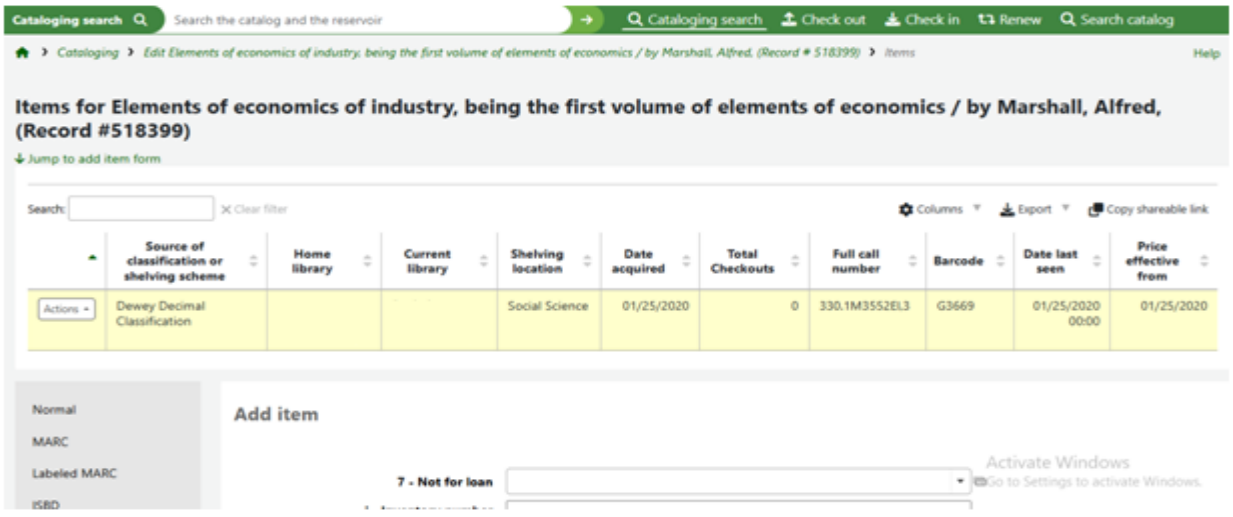
For corrections in ITEM, go to actions and click on edit incorrect Barcode number. is GXXXXX:



It requires correction in the Barcode field and clicking on Save Changes to save the item record:



After saving the record, the correct barcode number is GXXXXX.



CONCLUSION

The data rectification process in KOHA is both a technical task and a governance mechanism that supports library operations. Libraries rely heavily on Integrated Library Systems (ILS) for various functions such as cataloging, circulation, patron management, and reporting. Through systematically correcting data, systematic correction involves identifying and correcting errors, incorrect information, and outdated information in the KOHA management application, which optimizes the efficiency and accuracy of the KOHA management. Data accuracy can help in classifying data, provide accuracy, increase the effectiveness of the search engine, and increase the functionality level from both the System and Library points of view. Libraries require to possess accurate and current information, so that they may provide appealing services to their customers.

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