HETEROGENEOUS DATABASE: CONVERSION OF DATABASES FROM (.ACCDB FORMAT) TO (MRC FORMAT) AND INVEST IT IN INTEGRATED LIBRARY MANAGEMENT SYSTEMS BY USING A PROTOCOL(Z 39.50)

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ABSTRACT: *The paper identify the concept of heterogeneous databases and it problems. And the clarify what are open source systems, integrated systems and integrated library management system (koha), As well as the paper discusses the practical application of converting databases the General Secretariat of the Central Library of Al –Iraqia University From Access program(.acdb extension) to the Integrated Library Management System (Koha) using the MarcEdite program(MRC extension)by using a protocol(Z 39.50), in order to make full use of the databases and convert them directly into the integrated library management system (koha). It will be reduced time and effort and completing the input process in the new system.*

KEYWORD: Computer Science, Database, heterogeneous databases, Open Source system, Integrated Library Management System, Koha, Z 39.50 Protocol.

INTRODUCTION

The world arena is facing rapid and successive developments in the field of automatic systems and their applications in the field of information institutions. Which strives to make full use of the digital information environment for the purpose providing the best services and the most accessible ways for the beneficiaries community and its services.

Iraq's university libraries as one of the most important information institutions, it faces major challenges today because of their lack of advanced software applications through which their services can be updated to suit the growing needs of the user community. For it gets quick information and advanced through standardized electronic gates. Now, more than three decades after the start of computing projects in those institutions that relied on programs like (Winisis, Access, Excel) Which is one of the systems of unilateral application, which did not allow within the technical characteristics to make a tangible development in the field of comprehensive computing. Most of the computing experiences in Iraqi university libraries were limited to building automatic indexes databases only. With the significant development of library information systems and the emergence of Open Source Systems, it has become important for Iraqi university library administrations to seriously considering the implementation of the transition to integrated systems [1].

THE FIRST SECTIONS GENERAL FRAME WORK FOR STUDY

(1.1)   THE PROBLEM OF THE STUDY

The problem of the research is two sides: the first side, the General Secretariat of the Central Library of Al –Iraqia University is having databases of bibliographic information within the (access) program, it is used in the field of automatic index only without being invested in the technical procedures of the libraries like Acquisition, Borrowing, periodicals, reports, beneficiaries. The second side, while updating the databases of the automatic index, there is a problem with the repetition of the registers and the constraints, which leads to a very large base with the repetition of their recordings.

(1.1)   OBJECTIVES OF THE STUDY:

The aim of the research is to make full use of the databases and information in the central library of the Iraqia University and it converts into the integrated library management system like (Koha) and complete the input in the system (Koha) after the completion of the conversion process.

(1.2)   THE IMPORTANCE OF STUDYING:

The importance of the study is through maintaining the databases in the central library of the Iraqi University and converting it into integrated library management systems. It is made easier for the library to write hundreds of cards at once in a library and share them with other libraries and open the doors for cooperation projects between all libraries (international, Arab, local).

(1.3)   RESEARCH METHODOLOGY

Researcher used experimental and practical approach

(1.4)   THE STUDY PROCEDURES

1. The databases are Arranging and Sorting of the General Secretariat of the Central Library of Al –Iraqia University, and discarding some fields of them.
2. Convert databases from(.accdb extension) to (.xlsx extension) and (.mrk extension) to (.mrc extension).
3. Working on the Marcadit program in the process of converting databases.
4. Installation of the integrated library management system (Koha).
5. Importing databases of the Secretariat of the Central Library of Al –Iraqia University into the Koha system.
6. Search and retrieval through the Integrated Library Management System (Koha) in the (opac) interface.

(1.5)   SEARCH LIMITS

The spatial border: **Baghdad.**
The temporal borders: 2017 -2018.

THE SECOND SECTION
THEORETICAL SIDE
(2.1) UNIVERSITY LIBRARIES

It is a cultural institution and educational and scientific that works to serve a particular community of students, professors, teachers and researchers, by providing them with the information they need in their studies and research through the provision of knowledge to meet their needs. By it is organizing, classifying, indexing them to facilitate their access to beneficiaries, and so that the evaluation of

university library services remains worthwhile and it is thus an essential part not to exceed and indispensable [2].

(2.2) LIBRARY AUTOMATION

Library automation is the use of computers, devices and other machines and equipment for production of data and data processing for the development of to develop technical procedures for libraries like acquisition, cataloguing, information retrieval, circulation, automatic indexing and abstracting and automatic text analysis [3].

(2.3) OPEN SOURCE INTEGRATED LIBRARY SYSTEM

- ❖ Fastest and quick service in a library is a real question for library reader service and development of the library, so we need to develop entire the library system in any state or country.
- ❖ Reduces effort and provides time for the staff user and user and helps in preservation of gathered reading material and information for more generation.
- ❖ Koha ILS is full featured software that has acquisition, serials control, cataloguing, circulation etc and is based on client server architecture.
- ❖ Koha can be used with any operating system.
- ❖ Koha software includes Z39.50, MARC 21, Web based, Barcode generation, Unicode support and conversion features [4].

(2.4) CRITERIA FOR ESTIMATING OPEN SOURCE INTEGRATED LIBRARY SYSTEMS

- ❖ Active current development under way.
- ❖ Availability of modules and their completeness: At least the circulation, cataloging, patron access serials control, catalog modules and acquisitions must be available. It must be an Integrated library system.
- ❖ It supports international standards for library management systems such as MARC, Z39.50, etc.
- ❖ Current source code and documentation are exist for downloading under the GNU General Public License.
- ❖ It has scalability.
- ❖ Designed specifically for working in a library environment
- ❖ The user interface is highly customizable and adaptable [5, 6].

(2.5) WHAT IS A DATABASE?

A database is a set of records System in short, called (DBMS).The function of the database is save data, make additions, search, edit, delete, sort data, retrieve data that match particular criteria cross-reference data in different tables and extract reports. It consists of attributes (columns) and records (rows). It is an easy manipulation of data [7].

(2.5.1) Definition of databases

A database is a set of information and data that are organized together in a table or set of tables, queries and reports in order to retrieve these data later in a way that is easier and faster to make decisions [8].

(2.5.2) E- database

Electronic-Databases (e-databases) Electronic-Databases (e-databases) have become an created ingredient of many Information Centers and academic libraries collection. These are an electronic container that includes a number of books, e-books, magazines, references, graphs, conference papers, video clips, reports and all is suitable for citation in scientific research. These are therefore appropriate and suitable to use. There are different Types of these databases like bibliographic, full-text, directory, numeric and multimedia. These are widely available and can be accessed from anywhere and by many users Simultaneously [9].

(2.5.3) Types of Databases

Databases can be divided into two main categories, namely: (a) Databases of the primary sources of information (also called source databases), and (b) Databases of secondary sources of information (also called reference databases). Source databases provide information in electronic form or are databases of electronic documents, which contain primary information in electronic form [10].

(2.6) WHAT IS A HETEROGENEOUS DATABASE?

A heterogeneous database is an mechanized (or semi-automated) for the integration of heterogeneous, dissimilar database administration frameworks to show a client with a single, bound together inquiry interface.

Heterogeneous database system (HDBs) is computational models and program execution that give hetrrogeneous database integration [11].

(2.6.1) Issues of heterogeneous database integration

- ❖ **Technical heterogeneity**
  Different file formats, access protocols, query languages etc. Often known as syntactic heterogeneity from the point of see of information.
- ❖ **Data model heterogeneity**
  Different approaches of representing and storing the same data. Table decompositions might also vary, column names (data labels) can also be one of a kind(but have the equal semantics), statistics encoding schemes can also fluctuate (i.e., must a size scale be explicitly included in a field or ought to it be implied elsewhere). Also referred as schematic heterogeneity.
- ❖ **Semantic heterogeneity**
  Information over constituent databases may be related but diverse.
  Maybe a tabase system should be able to integrate genomic and proteomic data. They are related—a quality may have a few protein products but the information are

different. There may be numerous ways of looking at semantically numerous but unmistakable, datasets[12] .

(2.7) KOHA
Koha is the first of its type and it is free, an open source integrated library system. Koha became a viable, scalable solution for libraries of all kinds (University Libraries, school , special libraries and public). Its development and growth is guided by community of users and libraries across the world, who work together to achieve its aims and technological objectives. It has all the basic features that libraries need and the user interface is highly customizable and adaptable. The name of the ILS becomes koha from a term called Mãori which means a "gift" or "donation". The ILS is developed at a modern platform and is a web-based solution for the libraries. Koha deals with a SQL database (MySql preferred) as a backend and its cataloguing data stored is in MARC and is accessible by Z39.50 protocol. Koha is an integrated library system that has state of the art web based interface, gives faceted, progress through user contribution, enhanced content and substance, up-gradation and provisions keyword seeking and provides Rich Site Summary (RSS) feeds that make it unique integrated library software in the world. At present Koha has four specific language websites including Spanish, French, Italian, Chinese. This system has been translated into many languages, including Arabic [13].

(2.8) DEFINITION OF A PROTOCOL
The Z39.50 a set of protocols to describe and establish communication between two or more systems, in order to allow research and exchange of bibliographic data between similar databases and are not necessarily identical. That is, this protocol does not require knowledge of the characteristics of the related systems, but it is sufficient that the system supports the protocol Z39.50 This protocol depends on the server and the client in the retrieval of information. Increasingly, this protocol has become commonplace for linking automated library systems [14].

The Z39.50 protocol offers non-traditional and advanced facilities to process some issues and problems facing libraries. Among the most prominent of these issues face the accumulation of information (organization and availability), as well as resource sharing issues. It can be said that Z39.50 has created an opportunity for libraries to improve access by beneficiaries to the information they want more easily and simple. This protocol has a number of functions and services that have made it fertile environment for a number of applications in the following areas: Search and retrieval operations, availability of catalogs in online through OPAC, interlibrary loan, document delivery, selective dissemination of information service and search using unified GUI features [15].

THE THIRD SECTION
PRACTICAL SIDE

(3.1) CONVERSION OF DATABASES OF THE GENERAL SECRETARIAT OF THE CENTRAL LIBRARY
The importance of information has increased in the present of the importance of database systems to organize the information we need it and provide it for use in the appropriate manner and the appropriate time. Where the General Secretariat of the Central Library of Al –Iraqia University has worked on the organization of its databases using the program (access). Where it has two databases (databases of books, databases of theses).

STEPS TO CONVERT DATABASES
In order to initiate the process of conversion from single systems to integrated systems, we need in this research a set of the following systems and programs:
1. Databases built according to access program.
2. Excel is a system within a Microsoft Office package that handles processes data for statistical purposes.
3. MarcEdite Program.
4. Integrated Library Management System (Koha).

First: - Export the data in the access program (Databases built according to access program) to the Excel program.
The first step is to open access database and define the basic fields to convert them to Excel program. See Figure (1).

Figure (1) Shows the database in the access program

There are fields in this database that are not needed in the conversion process, such as the name of the data entry, the date of entry, the partition passed to it, defined because these fields are not compatible with Marc 21. These were deleting and after deleting the fields the data is exported to Excel program. See Figure (2).

Figure (2) Export data to Excel.

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Where the data is exported from the access program (.accdb extension) to the Excel program (.Xlsx extension) and the file is saved with a specific name such as the database of books.
Second: - Convert from Excel program (.Xlsx extension) to (.Mrk extension).
The format is converted from the Excel program (.Xlsx extension) to MarcEdit (Mrk extension) using the MarcEdite program. After opening the program, then press **Add**-and select **delimited text translator**. See Figure (3).
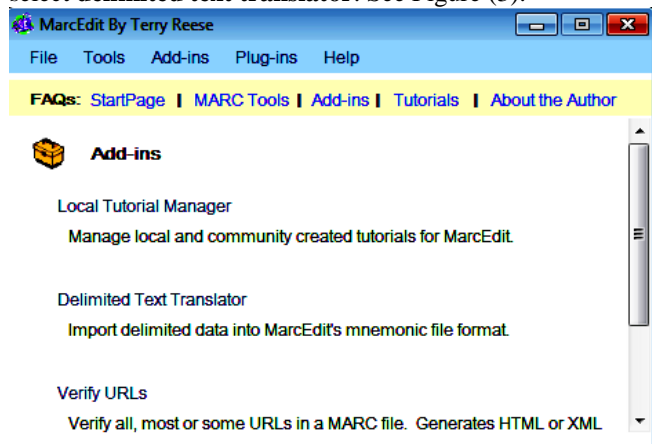

Figure (3) Shows the delimited text translator.

Click **Next** when the following window appears. See Figure (4).
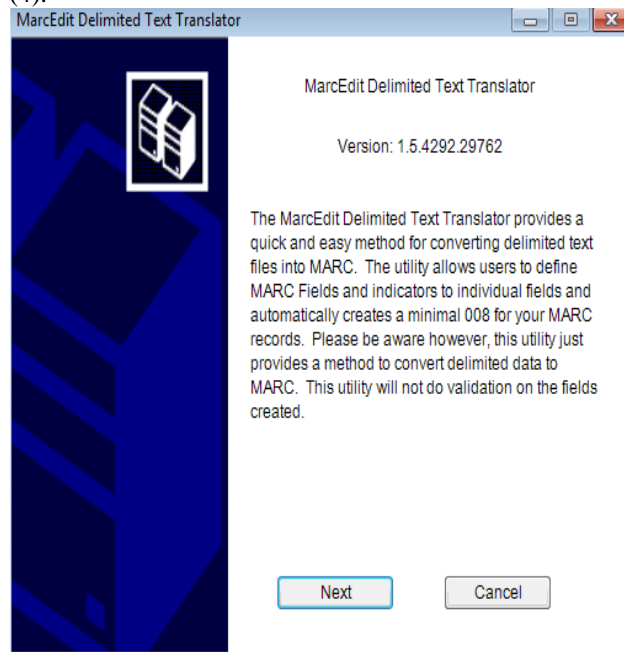
Figure (4) Show Mac Edit Delimited Text Translator window.

Then browser, your Excel file by press **browse** button. See Figure (5).
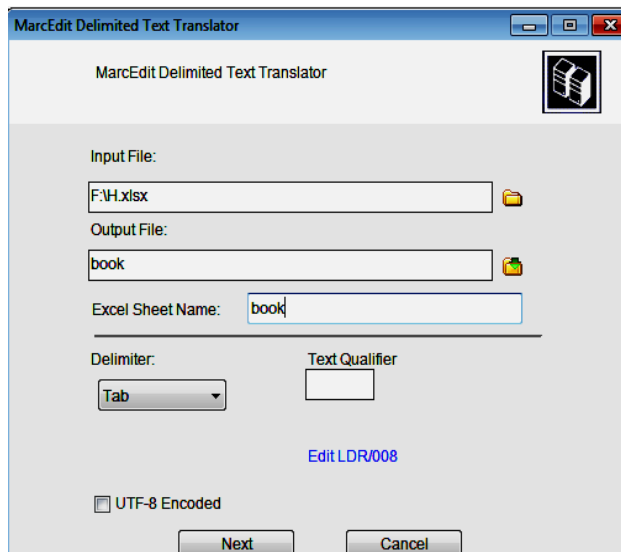
Figure (5) Show browser Excel file.

Locate the Excel file by selecting an Excel file format (* .Xlsx). See Figure (6).
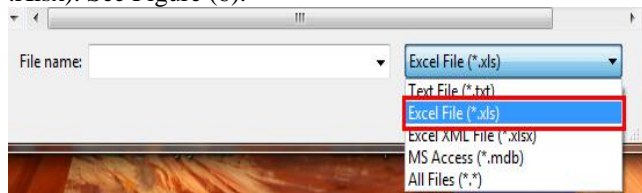
Figure (6) Shows the locate the Excel file.

Then select the **input file**, and select the **output file**, and then make sure select the coding **UTF-8 Encoded,** Such as shown in Figure (7).

Figure (7) Show the select the UTF-8 Encoded window.

And then we map the fields to recognition fields by standard Marc formats. Let's say for field 0, the map is inserted in the first column 245. And then press apply and press **finish** as shown in Figure (8).

Figure (8) Show the map the fields to standard Marc formats window.

Then a window will appear indicating that the text file MARC (*. MRK) was created. As shown in Figure (9).

Figure (9) Show the process of creating file was successfully window.
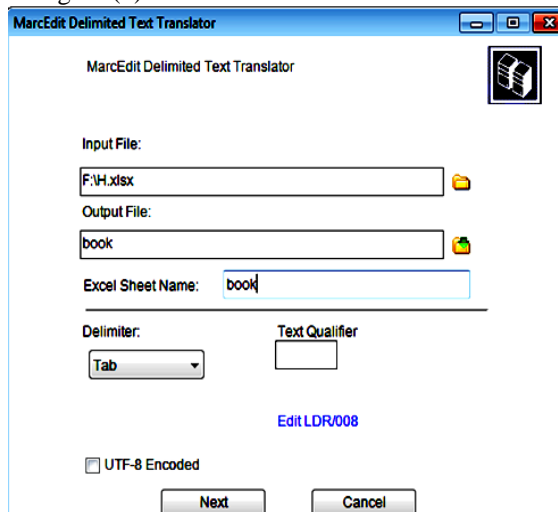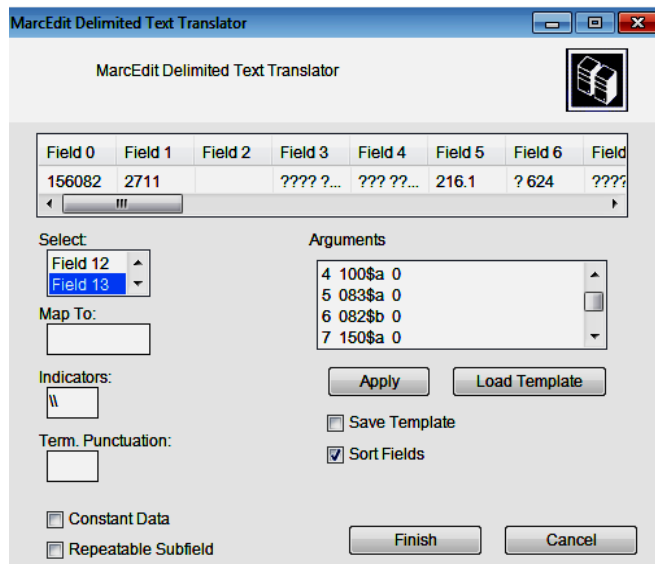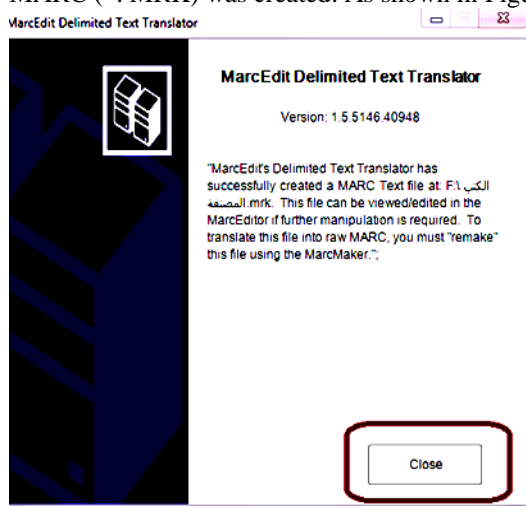
Click **Close** and create a Marc file(Mrk file) from the Excel file (Xlsx file). In this step. You can view the file by double-clicking on it.

Third: - Convert the Marc file (.mrk extension) to the Marc 21 file (.mrc extension)**.**

We will convert a (. Mrk file) which we created in the above step in Marc Raw form which can be imported directly into the koha system.

We reopen the **Marcedit** program again and select **Marc tools.** As shown in Figure (10).
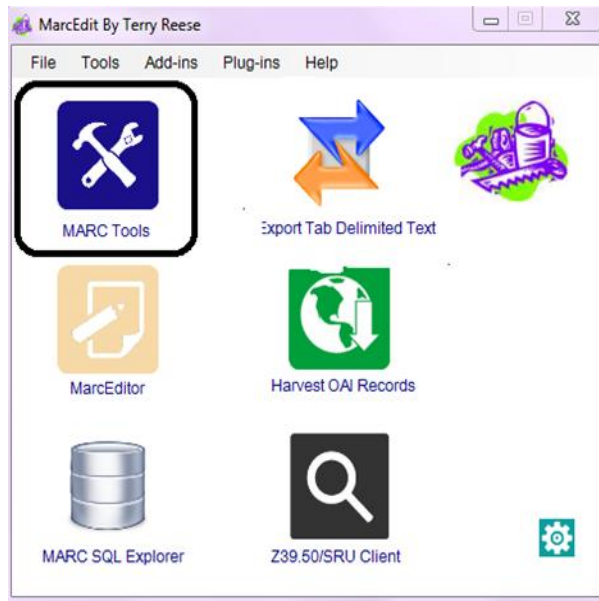
Figure (10) Show the MarcEdit window.

We select the name of **the Marc file** and then choose where to save **the MRC file** and make sure select the **MarcMaker** formula and press **Execute** to show us the number of recordings that have been organized and then close the window as in Figure (11).
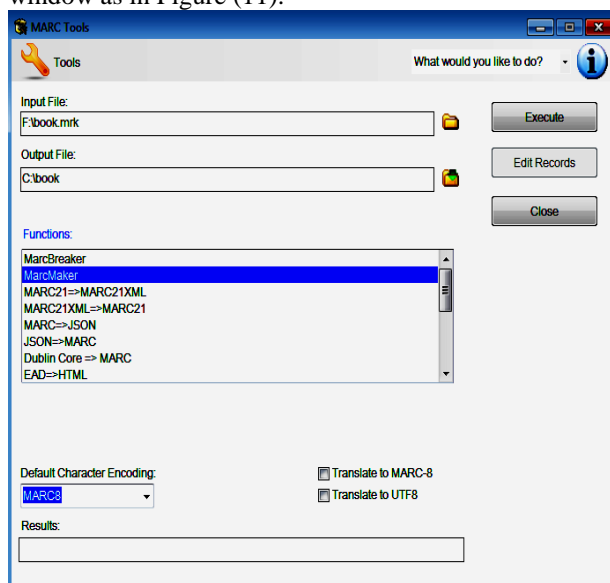
Figure (11) Show the Marc tools window.

Fourthly: - Import the MRC file (.mrc extension) in the Koha system.

Finally, we will import the (.mrc extension) file created in the above step in the koha system.

Click on the **tools** in **staff client** window in the Koha system. As shown in Figure (12).

Figure (12) Show the staff client window.

Then press the **Stage MARC record for import** .After that, We choose the (.mrc)file that was created previously by Click on **browse** button . With the Koha system. And click on **upload** button. As in Figure (13).

Figure (13) Show the Upload window.

Click on **Staged MARC record Mangement** button to show us the imported recordings. See Figure (14).

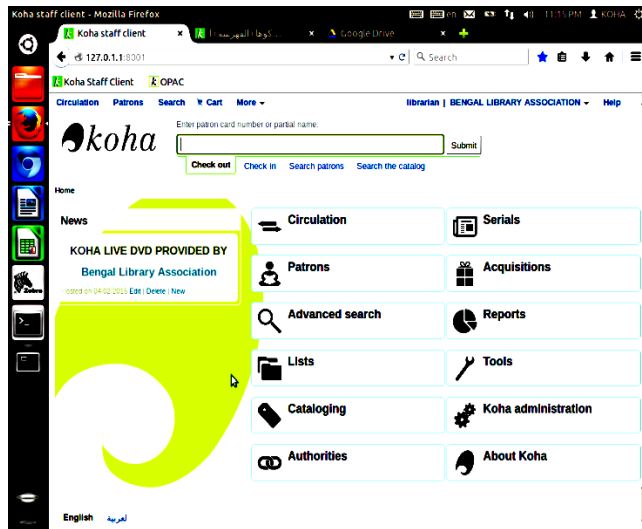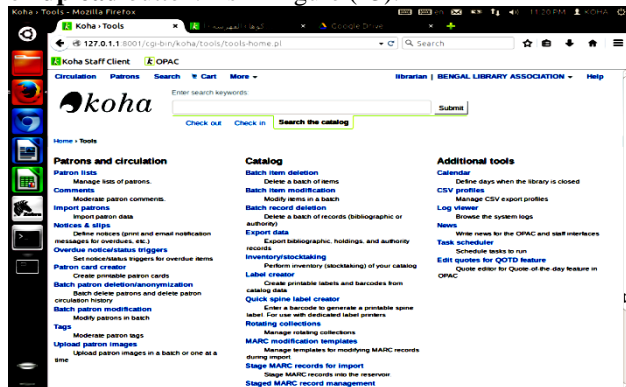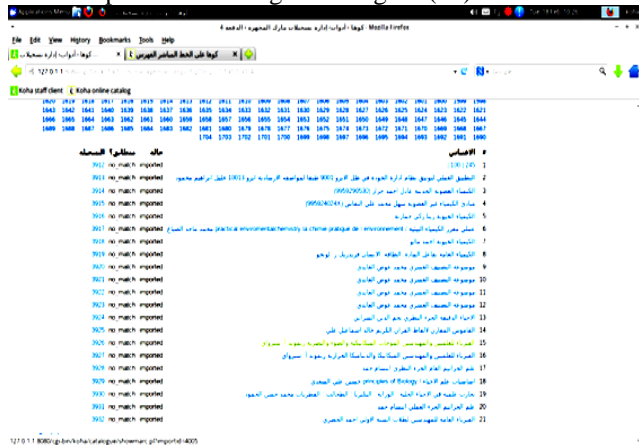**Figure (14) Show the imported recordings window.**

We are working to upload the records for the index to be retrieved, by press the **upload file** button and then press the **stage for import** button. See Figure (15).

Figure (15) Show upload the records window.

Opens your opic window to show us the database that has been imported into the koha system to be ready for search and automatic retrieval. See Figure (16).

Figure (16) Show database window.

THE FOURTH SECTION
RESULTS AND RECOMMENDATIONS
(4.1) THE RESULTS:
1.   The General Secretariat of the Central Library did not rely the structure of MARC 21 in building their databases.
2.   The integrated library systems have reduced time and effort in the work of technical procedures by Indexing and classifying the sources of information through the importation of records.
3.   Integrated Libraries System enables to provide electronic borrow services and booking of electronic resources.
4.   Employees of the General Secretariat of the Central Library need training to work on integrated library management systems (KOHA).
5.   The General Secretariat of the Central Library did not rely on standardized measures to build its databases.
6.   The General Secretariat of the Central Library needs specialists in the management of integrated library management systems.

(4.2) RECOMMENDATIONS:
1. Urge university libraries to adopt Mark 21's structure in building their databases.
2. Chosen of integrated library management systems depending on library needs and available financial resources.
3. Urging university libraries to use integrated library management systems and convert their databases into integrated systems.
4. Training the staff of the university libraries on the use of automated systems and how to use them for the development of library services and the possibility of benefiting from them.
5. Providing specialists in dealing with integrated library management systems in university libraries.

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