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## METADATA INTEROPERABILITY FOR CATALOGUING OF E-JOURNALS : A COMPARATIVE STUDY OF LIBSYS, MARC21, AND CONSER

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### Abstract

*The content of digital libraries includes data and metadata that describe various aspects of the digital record that consist of links or relationships to other data or metadata, whether internal or external to the digital library. Metadata is provided in order to provide richer searching than would be possible using standard free-text indexing. In particular it was desirable to allow users to search on a number of fields including Author, Title and Description. Metadata Expand the use of data incorporated in the digital object or text, and find ways of integrating different kinds of metadata. Metadata has been defined as "data about data". It is information about an electronic resource which may be embedded in the resource. According to Gilliland-Swetland metadata is more than description; a more deeper conceptualization of metadata is needed as information professionals consider the range of their activities that may end up in included into digital information systems.*

*There are three main types of metadata Descriptive metadata; Structural metadata; Administrative metadata. Traditional library cataloguing is a form of metadata and MARC21 and the rule sets used with it such as AACR2 are metadata standards. Metadata is particularly useful for large collections of documents or other materials, it can be used for managing the resource and for finding specific items. A Catalogue becomes as found by some libraries an essential tool for retrieval.*

*Increasing size and complexity of the digital information available on the web, demands for new methods of its organization. Uniform and structured meta information which can effectively be employed to achieve this goal.*

*"LibSys for library automation" is the prime mission of New Delhi based software company - Info-Tek Consultants Pvt. Ltd. The Libsys metadata facilitates ordering receiving loose issues, recording bound volumes of journals in print medium this can be easily converted to e- Journal recording by changing the item receiving data into e-journal release data. The location metadata in libsys can be easily converted to url.. Bound volumes can give the link to Url*

*The Library of Congress' Network Development and MARC Standards Office is developing a framework for working with MARC data in a XML environment. This framework is intended to be flexible and extensible to allow users to work with MARC data in ways specific to their needs.*

*CONSER(2) began in the early 1970s as a project to convert manual serial cataloging into machine-readable records. It has evolved into an ongoing program to create and maintain high quality bibliographic records for serials. In keeping with its evolution, the name changed in 1986 from CONSER (CONversion of SERials) Project to the CONSER (Cooperative ONLINE SERials) Program. Describing electronic access to information is another challenge for the cataloger due to the different areas of the record involved, including the new electronic location and access field (856).*

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*Metadata as a tool to facilitate exchange of information between interoperating systems and interoperability of metadata schemas themselves which can help to facilitate systems interoperability. There are three different types of interoperability. The table provide a comparative statement of interoperability between libsys, marc 21 and conser (Cooperative Online Serials) Program*

**Keywords :** MARC21, LIBSYS, E-Journal, Metadata

## 1. INTRODUCTION

The content of digital libraries includes data and metadata that describe various aspects of the digital record that consist of links or relationships to other data or metadata, whether internal or external to the digital library . Interoperability, as defined by the IEEE is "The ability of two or more systems or components to exchange information and use the information that has been exchanged. This makes it necessary that every library has to examine the issue of data and metadata required for accessing their documents. Metadata is provided in order to provide richer searching than would be possible using standard free-text indexing. In particular it was desirable to allow users to search on a number of fields including Author, Title and Discription. In addition it was felt desirable to allow users to restrict searches by issues by article type (e.g. feature article, regular article, news, etc.) In this paper we compare the metadata elements chosen by Libsys, Marc, and conser program for E-journals and to see whether they are interoperable

## 2. METADATA

Metadata Expand the use of data embedded in the digital object or text, and find ways of integrating different kinds of metadata. Metadata has been defined as "data about data". It is information about an electronic resource which may be embedded in the resource. Currently work is being done to define a metadata record which adequately describes a wide range of electronic objects. The aim is to give the authors or information providers associated with electronic resources the means to describe the resource themselves, to a defined standard. The idea is that in describing the resource you need something which is more informative than an index entry, but less complete then a formal cataloguing record.

According to Gilliland-Swetland metadata is more than description; a more inclusive conceptualisation of metadata is needed as information professionals consider the range of their activities that may end up in incorporating it into digital information systems. Repositories also create metadata relating to the administration, accessioning, preservation and use of collections. Acquisition records, exhibition catalogs, and use data are all examples of these, even though they are largely still created in paper form."

There are three main types of metadata

1. Descriptive metadata : Describes a resource for purposes such as discovery and identification. It can include elements such as title, abstract, author and keywords
2. Structural metadata : Indicates how compound objects are put together, for example how pages are ordered to form chapters
3. Administrative metadata : Provides information to help manage a resource, such as when and how it was created, file type and other technical information and who can accesses it. There are several subsets of cataloguers decisions about whether a catalogue record should be created for a whole set of volumes or for each particular volumes in the set, so that the metadata creator makes similar decisions

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Metadata is structured information that describes, explains locates or otherwise makes it easier to retrieve, use or manage an information resource. Traditional library cataloguing is a form of metadata and MARC21 and the rule sets used with it such as AACR2 are metadata standards.

Metadata can be embedded in a digital object or it can be stored separately. Metadata will not be lost and obviates problems of linking between data and metadata, and helps to ensure that the metadata and object will be updated together. In this paper we intend to compare the interoperability of Libsys metadata with Marc 21 and Conser. Before delving into this , cataloguing E-journals using metadata will be described in the next section.

### **3. HOW TO CATALOGUE E-JOURNALS USING METADATA:**

Metadata is used to improve the utility of data by providing a structure of framework for describing that data. Metadata elements are in effect fields of information that can be stored and manipulated in catalogue. Metadata is particularly useful for large collections of documents or other materials, it can be used for managing the resource and for finding specific items. A Catalogue becomes an found by some libraries is an essential tool for retrieval.

Libraries made a commitment to provide users with online access to full-text journals, found in publisher packages and aggregator databases, via Web lists and OPAC with details such as holdings coverage, embargo, source, open access, and local subject headings. The metadata of e-journals were first tracked on spreadsheets in EXCEL for Web lists and were also cataloged in the OPAC, a dual-maintenance system which later proved to be needing improvement as library electronic journal collection expanded. Libraries thus developed an interim solution and a long-term solution for managing e-journals access. The interim solution is to replace EXCEL with Microsoft ACCESS in processing e-journal metadata, still a dual-maintenance system but with greatly reduced maintenance work and enhanced timeliness of e-journal metadata in the OPAC and on the Web lists. The long-term solution is to generate e-journal Web lists from the OPAC with streamlined e-journal metadata batch-loading process using Innovative's Electronic Resources Management Module,.

The OCLC / NCSA Meta Data workshop in Dubin, Ohio held in 1995 proposed the following core set of elements to appear in URC(Uniform Resource Characteristics) : Title, Creator, Subject and Keywords, Description, Publisher, Contributor, Date, Resource Type, Format, Resource Identifier, Source, Language, Relation, Coverage and Rights Management.

Increasing size and complexity of the digital information available on the web demands for methods of its organization. Uniform and structured meta information which can effectively be employed to achieve this goal. Metadata support efficient and effective organization, access and retrieval of information contents in a digital library. Meta information is used in effective designing of browsing and search interfaces of a digital library.

Describing a resource with metadata allows it to be understood by both human and machines in ways that promote interoperability. Most metadata schemes include elements such as standard numbers to uniquely identify the work or object to which the metadata refers. Metadata is key to ensuring that resources will survive and continue to be accessible into the future.

Metadata elements are in effect field information that can be stored and manipulated in a database or a stylesheet. Alternatively the data elements may be embedded in a document, delimited by tags. The marked up metadata tags may also include details of the metadata schema used and the encoding system that has been adopted. Information retrieval is through a combination of key words, menus, and graphic map interfaces. Descriptions include the data custodian, custodian location, data cost, data quality, confidentiality constraints, spatial coverage, time period and a short description of the data set. The next section discuss access to E-Journals via internet.

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#### 4. E-JOURNALS ON THE INTERNET

Using the Web, publishers can easily distribute hypertext documents with multimedia components to a global audience, and they have been actively experimenting with Web versions of new or existing electronic serials. The Journal of Internet Cataloging also looks at:

- uniform resource identifiers and link-resolve services
- usability testing
- interoperability, crosswalks, and mappings among metadata schema
- learning object metadata
- using classification and automated assists for organizing Web resources
- software and hardware for retrieving, reviewing, and describing Internet resources
- managing the cataloging process of Internet resources
- the problems of maintaining catalog records for remote electronic resources
- descriptive and subject cataloging applied to Internet resources
- education and training
- international issues in organizing/cataloging Internet resources .

The Journal of Internet Cataloging is an essential resource for practicing librarians and information specialists, library and information science educators and students, and systems administrators. The following sections describe individual library/group metadata for cataloguing e- journals

##### **LIBSYS**

“LibSys for library automation” is the prime mission of New Delhi based software company - Info-Tek Consultants Pvt. Ltd., engaged in providing software solutions for General Insurance and ERP/CRM since 1984. Its continuous growth for the last 12 years, has made LibSys a defacto standard for libraries in India. Its acceptance in global market further strengthens its popularity across the country as the most field proven library system in a wide spectrum of libraries with unmatched depth in functionality and features.

The following is the libsys metadata structure for serials record

The screenshot displays the LIBSYS 4 (Rel 5.0) - OPAC - IISc, Bangalore interface. The window title is "LIBSYS 4 (Rel 5.0) - OPAC - IISc, Bangalore". The menu bar includes "Menu", "Systems", "Setup", "Tables", "Options", and "Help", and the "Exit" button is visible. The interface is divided into two main sections: "SERIAL DETAILS" and "Controls".

**SERIAL DETAILS:**

- Title: SCIENCE
- Publisher: AMERICAN ASSOICATION FOR THE ADVANCEMENT
- Place: WASHINGTON
- Country: USA
- Location: 33/17
- Frequency: 51
- In Library: 67; 1928

**Controls:**

- Languages: E
- Types: 52/YR
- Start Year: 1928
- Alpha Code: S
- ISSN: 0036-8075
- Subs: 725.00 (Air Mail)
- Currency: US\$
- Vols/Year: 4
- Issues/Volume: 13
- Receipt Control: Vol:  Issue:  Vol\_Issue:  Period:  Iss\_Year:
- Binding: Required?:  Type of Binding:  Issues/Bound Vol:
- Indexes: Author:  Subject:  Contents:  Title:  Published... Separate?:  With Last Issue?:  With Next Volume?:

A "Select!" dialog box with a "Quit" button is visible in the bottom right corner. The taskbar at the bottom shows the Start button, network status (144.16.72.102), and several open applications including "deva - Microsoft W...", "LIBSYS 4 (Rel ...)", and "Document1 - Micro...". The system clock shows "Thu 06/09/2005 2:09 PM".

The Libsys metadata facilitates ordering receiving loose issues, recording bound volumes of journals in print medium this can be easily converted to e- Journal recording by changing the item receiving data into e-journal release data. The location metadata in libsys can be easily converted to url.. Bound volumes can give the link to Url.

## MARC 21

The Library of Congress' Network Development and MARC Standards Office is developing a framework for working with MARC data in a XML environment. This framework is intended to be flexible and extensible to allow users to work with MARC data in ways specific to their needs. The framework itself includes many components such as schemas, stylesheets, and software tools. Library of Congress ' Network Development and MARC Standards Office has developed a schema for a bibliographic element set that may be used for a variety of purposes, and particularly for library applications. An XML schema, the "Metadata Object Description Schema" (MODS) is intended to be able to carry selected data from existing MARC 21 records as well as to enable the creation of original resource description records. It includes a subset of MARC fields and uses language-based tags rather than numeric ones, in some cases regrouping elements from the MARC 21 bibliographic format. MODS is expressed using the XML schema language of the World Wide Web Consortium. Marc also provides url linking facility in its tag.

## Metadata recorded for Journal of the American Chemical Society.

<b>LC Control Number :</b>	sn 96038212
<b>000</b>	01590cas 2200361 a 450
<b>001</b>	11784983
<b>005</b>	20000511061112.0
<b>007</b>	heubmb024bucu
<b>008</b>	950508c19959999dcuwr pbb 0 0eng d
<b>010</b>	___  a sn 96038212
<b>035</b>	___  a (OCoLC)ocm32438440
<b>040</b>	___  a FTS  c FTS  d MCM  d DLC  d RPB  d CU-S
<b>012</b>	___  a -3-7-0005100385-p-9608
<b>042</b>	___  a lc
<b>050</b>	00  a Microfilm (0) 99/8014
<b>050</b>	14  a QD1  b .A4 Suppl.
<b>245</b>	00  a Journal of the American Chemical Society.  p Supporting information  h [microform].
<b>246</b>	30  a Supporting information, journal of the American Chemical Society
<b>246</b>	1_  i Vol. 117, no. 6 has title:  a Journal of the American Chemical Society.  p Supplementary material
<b>260</b>	___  a [Washington, D.C.] :  b American Chemical Society,  c c1995-
<b>300</b>	___  a microfiches :  b negative
<b>310</b>	___  a Weekly
<b>362</b>	0_  a Vol. 117, no. 5 (Feb. 8, 1995)-
<b>500</b>	___  a Title from eye-readable header.
<b>515</b>	___  a Assumes vol. numbering of parent journal.
<b>530</b>	___  a Online version available to subscribers with a site license; files in HTML and PDF format.
<b>650</b>	_0  a Chemistry  v Periodicals.
<b>710</b>	2_  a American Chemical Society.
<b>772</b>	0_  t Journal of the American Chemical Society  x 0002-7863  w (DLC) 16003159  w (OCoLC)1226990
<b>780</b>	00  t Journal of the American Chemical Society. Supplementary material  w (DLC)sn 96038213  w (OCoLC)4764975
<b>787</b>	1_  t ACS electronic supporting information. Journal of the American Chemical Society  w (DLC) 00242806  w (OCoLC)42258873
<b>850</b>	___  a DLC  a MCM
<b>936</b>	___  a Vol. 120, no. 7 (Feb. 25, 1998) LIC

Library of Congress Holdings Information Not Available

#### 4. CONSER PROGRAM

CONSER is :

- A cooperative online serials cataloging program
- A source of high quality bibliographic records for serials
- A source of high quality documentation and training materials for the cataloging of serials and the input of serial records
- A group of serial experts who work together in an atmosphere of collegiality and trust
- A promulgator of standards related to serials
- A voice for serials in the library community
- A component of the Program for Cooperative Cataloging

CONSER began in the early 1970s as a project to convert manual serial cataloging into machine-readable records and has evolved into an ongoing program to create and maintain high quality bibliographic records for serials. In keeping with its evolution, the name was changed in 1986 from the CONSER (CONversion of SERials) Project to the CONSER (Cooperative ONline SERials) Program. In October 1997, CONSER became a bibliographic component of the Program for Cooperative Cataloging.

now in process, serials catalogers will soon be in position to utilize all the computer file bibliographic record elements. CONSER has taken a major step in developing policies for these new elements with the publication .

Describing electronic access information is another challenge for the cataloger due to the different areas of the record involved, including the new electronic location and access field (856). AACR2 requires catalogers to "always specify the mode of access" for electronic serials in a note. [21] The CONSER "mode of access" note now includes more general information to limit redundancy with the 856 field, which contains the detailed information needed to locate and access documents. Serials catalogers now use the note field 538 (system details information) for the more general information as the field is newly available through format integration.

**OCLC: 31848943      Rec stat: c**

Entered: 19950118 Replaced: 19960205 Used: 19951207

Type: a	Bib lvl: s	Source : d	Lang :eng
Repr:	Enc lvl: 7	Govt pub:	Ctry:gau
Phys med:	Mod rec:	Conf pub: 0	Cont: ^^^
S/L ent: 0	Ser tp: p	Frequ: q	Alphabt: a
Desc: a	Regulr: x	ISDS: 1	
Pub st: c	Dates: 1995-9999		

1	010	sn95-7042
2	040	NSD \$c NSD \$d OCL \$d DLC
3	012	\$I 1
4	022	01080-6059
5	037	\$b Centers for Disease Control and Prevention, 1600 Clifton Rd., Mailstop C-12, Atlanta, GA 30333

6	042	nsdp \$a lcd
7	069	1 SR0083699
8	082 10	616 \$2 12
9	090	\$b
10	049	DLCC
11	130 0	Emerging infectious diseases (Online)
12	210 0	Emerg. infect. dis. \$b (Online)
13	222 0	Emerging infectious diseases \$b (Online)
14	245 00	Emerging infectious diseases \$h [computer file] :\$b EID.
15	246 30	EID
16	260	Atlanta, GA : \$b National Center for Infectious Diseases : \$b Centers for Disease Control and Prevention, \$c[1995-
17	310	Four times per year
18	362 0	Vol. 1, no. 1 (Jan.-Mar. 1995)-
19	538	Mode of access: Internet e-mail, FTP, and World Wide Web.
20	500	Description based on: hypertext/World Wide Web version; title from EID home page.
21	516 8	ASCII, Acrobat, and PostScript file formats
22	530	Online version of: Emerging infectious diseases (Print).
23	710 2	National Center for Infectious Diseases (U.S.)
24	776 1	\$t Emerging infectious diseases (Print) \$x 1080-6040 \$w (DLC)sn 95007041 \$w (OCoLC)31848353
25	856 0	\$u mailto:lists@list.cdc.gov \$i subscribe \$f EID-* \$z Include desired file format following the hyphen in the filename: IED-ASCII, EID-PDF, or EID-PS
26	856 1	ftp.cdc.gov \$d pub/EID \$l anonymous \$z Each issue is in a separate subdirectory (e.g., vol1no1). There are additional subdirectories for each file format
27	856 7	\$u http://www.cdc.gov/ncidod/EID/eid.htm \$2 http

## 5. METADATA INTEROPERABILITY

Metadata as a tool to facilitate exchange of information between interoperating systems and interoperability of metadata schemas themselves which can help to facilitate systems interoperability. There are three different types of interoperability :

1. Semantic interoperability : Achieved through agreements about content description standards
2. Structural interoperability : A data model that is used for specifying semantic schemas
3. Syntactic interoperability : Which provides a syntax for expressing metadata : an example is XML

### Metadata crosswalks

A crosswalk allows metadata created by one community to be used by another group that employs a different metadata standards. Crosswalks are important for virtual libraries where resources are being collected from a variety of sources and are expected to act as a whole, perhaps with a single search engine applied. While these cross walks are key they are also labor intensive to develop and maintain.



Reconciling metadata created in different environments is a major challenge and some effort has been devoted to mapping equivalent metadata elements between different metadata schemas. These mappings can be displayed as tables and are known as crosswalks. They can be used within systems to effect transformations between metadata objects. Crosswalks are a starting point for assessing the suitability of data sources for import.

Below mention table provide a comparative statement of interoperability between libsys, marc 21 and conser (Cooperative Online Serials) Program.

	<b>LIBSYS</b>	<b>CONSER</b>	<b>MARC21</b>
Title	Title	Title	245 : Title
Publishers	Pub	Pub	260 : Pub
Place	Place	Combined with pub	Combined with pub
Country	Country	Country	257can be used
Location/URL	Manual :Yes	Yes (Electronic)	856 (Electronic location)
Frequency	Frequency	Frequency	310
Starting Date	Starting Date:Manual	Yes (Electronic)	362 (Starting electronic pub)
Language	Language	Language	041
Alphe code	Alphe code	Not available	030
Control Number	Control Number	Control Number	010
ISSN	ISSN	ISSN	022
Vol.Year, Holding data	Available in separate file	Available in separate file	841
Subject	Subject	Subject	650
Supplement	Supplement recorded as an issue	NA	050
Note	Yes	Yes	500

The library participates in a metadata harvesting protocol to provide extracts of local metadata in a common format to a service provider so that information about the collection is automatically included in a number of relevant tools such as catalogs and portals. The Web page is linked to the library's web site dedicated to resources. Where it is available to researchers in context with archival and visual materials, digitized secondary sources, etc. Administrative, structural, and descriptive metadata for website also has been created to hold all of its pieces together to allow them to be managed and allow them to be accessed.

## 6 REFERENCES

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