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Transforming Thesaurus Records into MARC 21 and MADS: Designing a Framework for Libraries

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Abstract

Purpose

This paper analyzes various thesaurus formats for converting data and how they can easily be implemented in libraries. These data formats are very important and necessary because they can easily transfer data from one system to another. The main focus of this system is on the data format of the Thesaurus Constructon.

Methodology

It is made with the TemaTres tool, which is used by many other tools. It has many new and modern features that librarians can use to create a new interface. In other words, it is possible to link other software very easily through these formats. There are four main steps to follow to build this system such as (i) Study the Thesaurus Subject Repositories; (ii) Comparative Study of Controlled Vocabulary Tools; (iii) Construction of Controlled Vocabularies; (iv) Creation of Formats for Thesaurus.

Findings

Users will benefit a lot from using this interface as they will be able to access all the information they need very easily. In addition, two of these formats, MARC21 and MADS, can be imported into Koha, allowing users to access additional information from Koha's OPAC interface that is located within TemaTres.

Originality

With these concepts, thesaurus of any subject can be created and data linking between other software can be done. It is possible to publish any types of linked data formats with the help of Apache Jena and Apache Jena Fuseki to external integration for easy access of metadata. Therefore a prototype vocabulary can be created through this system from which all libraries can benefit.

Keywords: MARC21, MADS, Koha OPAC, TemaTres, Apache Jena Fuseki, and Linking formats

Introduction

Today, the use of information and technology has increased more than before because the amount of information has also increased accordingly. For this reason, the information needs to be stored properly so that it can be provided to users of this service in the future. A library is an information repository where all the information is organised by adopting a systematic method so that this necessary information can be properly distributed among the users. Currently, there are many digital repositories where electronic services are provided through computers. So the librarians are very keen to use this method and system, but due to a lack of proper planning, it has not become possible to implement it in all the libraries. Thesaurus and Controlled Vocabulary System is a critical concept for providing modern services. Many systems and methods are generally used to create digital libraries, but due to a lack of proper technical understanding, it has not yet become possible to implement them in all libraries. It is not only a digital library, but library automation can be improved with this system. However, currently, libraries take the help of some tools to provide these services, through which librarians can easily provide these digital services to users. This can make the library more modern, but it also needs to be kept in mind that proper training should be provided to the librarians and so that it is simple for them to use the apparatus. However, this academic article's prime focus is to convert lexical concepts into MARC 21 and MADS formats, thereby improving any digital library or automated library, as these two formats can be easily imported into Koha databases. Here is how to do this with TemaTres software.

Review of related works

It intends to share with advanced library professionals the change plan of a web imagery collection that plans the interrelated framework of a managed glossary to maximize tend to work. There has been a lot of work done on the topic of using thesaurus structures in search and browsing, but there aren't many real-world instances. Digital library resource designers can use this paper's online image collection as an example of how to incorporate restricted vocabulary and metadata structures into more dynamic user interfaces (Dalmau et al., 2005). Researchers at the Library of Canada and the Canadian Association of Library and Information Technology Centres looked into how Canadian digital library search interfaces use KIS (Shiri & Molberg, 2005). An assessment of the EURATOM thesaurus' rank-frequency distribution was accomplished. It was determined since Zipf's law, an exponential variable, was not suitable for this distribution. Randomness of the entire vocab, as determined just used the ability of a ten factor, and the real diversity were all in excellent accordance (Toma, 1971). National Academy of Health Archives the Organization for Interoperable

Core Network Taskforce in February 2014. This author presents an experimental project to transfer XML to RDF Biomedical Academic Word. It will evaluate the partnership approach, technical and operational problems, and library compatibility (Bushman, Anderson & Fu, 2015). The Game Metadata and Citation Project developed Linked Open Data (LOD) lexical resources for virtual world platforms and media files (GAMECIP). Authors talk about how computer game library records need to be more precise and consistent (Kaltman et al., 2016). There is an unique method based by the FAO that really can accurately capture phrases from agricultural records. A state-ofthe-art key frame retrieval controller is similar to the new approach (Medelyan & Witten, 2005). Lightweight taxonomies and Big Data value vocabularies, or LOD KOS, are used in this work. The study investigated accumulated instances (whether in the laboratory or in the field) and searching for LLD KOS programs (Mayr & Zeng, 2018). Simple Knowledge Structure of the system is indeed a Semantic Web language for terminologies. It's a framework for publishing lexicons, categories, and tags. Miles and Pérez-Agüera (2009) by combining SKOS data, applications can speed up the process of fetching many collections at once. In order to explain the fundamentals of a scheme of ideas, SKOS Core can be used, as it is a language for RDF. In order to support the proposed integration of knowledge core and DCMI Metadata Items, this work provides a foundation for doing so (Miles et al., 2005). In the process of moving from a thesaurus to an ontology, there was no common standard. In this work, the W3C-recommended knowledge organisation system (SKOS) for the transformation is introduced. The SKOS core vocabulary is used to change the UKAT thesauri, and the skeleton technique is then used to test the ontology (Chunyan, Shuping, and Yucheng, 2007). The invention and investigation of a semi-automatic thesaurus construction methodology based on bibliometric techniques are the topics of the dissertation. The major goal of the dissertation is to revive and broaden the theoretical and methodological bibliometrics aspects of the study of knowledge organisation (Schneider, 2005). Two general approaches to creating computer-aided and digitised online thesauri are examined. A variety of approaches, including clustering and self-organizing mapping, were used to identify the semantic relationships between terms. It was also looked into how to build an online thesaurus (Shaghaghi, 2007). The ISO, BSI, and Aitchison/Gilchrist guidelines are among the topics covered. Compound terms, homographs, and other grammatical forms get extra attention (Somers, 1981). Indexing and retrieval in virtual libraries is made easier by the use of semantic metadata that describes the content of a document. This metadata is conveyed through keyword collections, thesaurus, and generalisations, to name a few aspects. Utilizing conceptual modeling strategies can eventually create a big wordlist simpler (Bechhofer & Goble, 2001).

Most of the ideas in these research papers are based on the thesaurus and discuss the use of the tool in some fields. What kinds of technical concepts are needed to create a thesaurus? is also looked at here. There are also many advanced discussions on how to use and develop web thesauruses for libraries. Many modern formats have emerged which can be used to provide new digital reference services. But these formats are nowhere discussed here, so naturally this research paper shows different methods to bring them to light. If this system could be used in all the libraries, it would be able to provide a modern service.

Methodology

Generally four methods are adopted to create these two formats viz:

- I. Study the Thesaurus Subject Repositories
- II. Comparative Study of Controlled Vocabulary Tools
- III. Construction of Controlled Vocabularies
- IV. Creation of Formats for Thesaurus

I. Study the Thesaurus Subject Repositories

The constrained vocab is a repository of easily retrievable and discoverable concepts. This part describes the application domain and specifies various standardized and alternatives wording. Controlled words, for instances, can be introduced to capture a wide range of words and ensure consistency between the use of preferred keywords and data allocation. Controlled vocabularies can be divided into four main categories – term lists, authority files, taxonomies and thesauri. These concepts play an important role in the development of new digital repositories, as they can be used to reflect modern search source libraries. Therefore, many library users will benefit immensely if these ideas can be translated into reality. Here are some popular examples in this regard, following are just the points in the Table-1-

Table-1: Thesaurus enabled subject repositories

[Source: https://pitt.libguides.com/metadatadiscovery/controlledvocabularies]

General Purpose	Sciences	Social and Behavioral Sciences	Arts and Humanities
LCNAF ¹	$AGROVOC^4$	AFSETH ⁹	AAT^{14}
$VIAF^2$	ICD^5	$DDICV^{10}$	ULAN ¹⁵
LCSH ³	$MeSH^6$	GNIS ¹¹	CONA ¹⁶
	NASATH ⁷	TGN^{12}	TGN^{12}
	$NALTH^8$	UTH ¹³	LCTGM ¹⁷
			RBMSCV ¹⁸

- 1 Library of Congress Name Authority File
- 2 Virtual International Authority File
- 3 Library of Congress Subject Headings
- 10 Data Documentation Initiative
- 11 Geographic Names Information System
- 12 Getty Thesaurus of Geographic Names Online

4 AGROVOC Multilingual Agriculture Thesaurus 13 UNESCO Thesaurus

5 International Classification of Disease 14 Getty Institute Art and Architecture Thesaurus Online

6 Medical Subject Headings 15 Getty Institute Union List of Artist Names

7 NASA Thesaurus 16 Cultural Object Name Authority

8 National Agricultural Library Thesaurus 17 Library of Congress Thesaurus for Graphical Materials

9 American Folklore Society Ethnographic Thesaurus 18 Rare Books and Manuscripts Section

Taxonomies or prescribed vocabularies are employed in metadata fields to promote the accurate, comprehensive, and fast searching and retrieving of digital content. Metadata design is an integrated process that considers whether and how many metadata fields will implement these services (Hedden, 2010). Authority files have alternate terms or equivalents for each item in the file. When one user enters a "non-preferred term," the software will recommend a "preferred term" to substitute it along with. However, various subject thesaurus repositories have been studied and found to be capable of providing good services from which to develop modern search interfaces in digital libraries, both now and in the future.

II. Comparative Study of Controlled Vocabulary Tools

Currently there are many tools related to thesaurus and controlled vocabulary but still all these tools have not gained much popularity, for that reason six tools are selected here namely MultiTes, PoolParty, TemaTres, ThManager, Vitro and VocBench. These tools were selected because they best support libraries in building thesauruses. But to select which tool is the best, twenty parameters are selected here and comparative study shows that TemaTres supports all the parameters. So naturally it can be concluded here from Table-2 that TemaTres helps a lot in building thesaurus and controlled vocabulary properly. Many high-level file formats are also available within TemaTres, making it easy to export to MARC21 and MADS Script. Therefore, with the help of this system it will be possible to develop digital repositories more modernly and above all the users of the library will be greatly benefited.

Table-2: Comparative study of controlled vocabularies

	Parameters	Tools for Controlled Vocabularies					
		MultiTes	PoolParty	TemaTres	ThManager	Vitro	VocBench
1	MARC 21	No	No	Yes	No	No	No
2	MADS	No	No	Yes	No	No	No
3	SKOS & Skos-core	Yes	Yes	Yes	Yes	Yes	Yes
4	SPARQL	No	No	Yes	No	No	No
5	OWL	No	Yes	Yes	Yes	Yes	Yes
6	RDF	Yes	No	Yes	No	No	Yes
7	Dublin Core	No	No	Yes	No	No	No
8	Tagging	Yes	Yes	Yes	Yes	Yes	Yes

9	Two way hierarchies	Yes	Yes	Yes	No	No	Yes
10	Multi hierarchies	Yes	No	Yes	No	No	No
11	PortalThes	No	No	Yes	No	No	No
12	VisualThes	No	No	Yes	No	No	No
13	Relationship of terms	Yes	Yes	Yes	Yes	Yes	Yes
14	BS 8723 & VDEX	No	No	Yes	No	No	No
15	Multilingual interface	Yes	Yes	Yes	Yes	No	Yes
16	JSON glossary format	No	No	Yes	No	No	No
17	Easy Install	Yes	Yes	Yes	Yes	Yes	Yes
18	Bulk editor for terms	No	No	Yes	No	No	No
19	Easy external integration	No	No	Yes	No	No	No
20	Systematic search	Yes	Yes	Yes	Yes	Yes	Yes

III. Construction of Controlled Vocabularies

This table replaces the equivalent of constructing a thesaurus of various types of topics through the TemaTres. So it is clear that with the help of this tool every library can use the word as per requirement. Therefore by adopting this method and system every library can achieve their objectives in a very short time. Whereas, BT: Broader Terms; NT: Narrower Terms; UF: Used for; RT: Related Terms. However, as shown in Table-3, librarians can easily develop a control vocabulary.

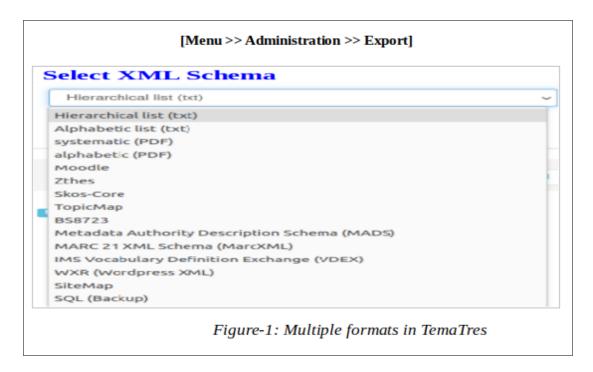
Table-3: Process of thesaurus construction

```
Library (BT)
                                                              Grammer (BT)
   Academic Library (UF)
                                                               Bengali Grammer (UF)
  Public Library (UF)
                                                                 English Grammer (UF)
  Research Library (UF)
                                                                   Sentence (RT)
  Other Library (UF)
                                                                       Kind of Sentence (NT)
      Digital Library (RT)
                                                                          Assertive sentence (NT1)
         Software for Digital Library (NT)
                                                                          Interrogative Sentence (NT2)
                  DSpace (NT1)
                                                                          Imperative Sentence (NT3)
                  EPrints (NT2)
                  Greenstone (NT3)
                                                                           Optative Sentence (NT4)
                 Invenio (NT4)
                                                                           Exclamatory Sentence (NT5)
                 Omeka (NT5)
                                                                          Simple Sentence (NT6)
Ebook Management (RT)
                                                                          Complex Sentence (NT7)
     Techniques of Ebook access (NT)
                                                                           Compound Sentence (NT8)
                Calibre (NT1)
                                                                       Part of speech (RT)
                Epubor (NT2)
                                                                         Noun (NT)
                Kindle (NT3)
                                                                                 Common nouns (NT1)
                Readerware (NT4)
                BookFusion (NT5)
                                                                                Proper nouns (NT2)
                Shelfari (NT6)
                                                                                Singular nouns (NT3)
                Lucidor (NT7)
                                                                                Plural nouns (NT4)
Library Automation (RT)
                                                                                Concrete nouns (NT5)
      Tools of Library Automation (NT)
                                                                                Abstract nouns (NT6)
                  Koha (NT1)
                                                                                Collective nouns (NT7)
                 NewGenLib (NT2)
                                                                                Compound nouns (NT8)
                 Emilda (NT3)
                 OpenBiblio (NT4)
                                                                                Countable nouns (NT9)
                 Librarysoft (NT5)
                                                                                Uncountable nouns (NT10)
                 Glibrary (NT6)
                                                              Literature (RT)
                 eLibrary LMS (NT7)
                                                                                Bengali Literature (NT)
                 Atriuum (NT8)
                                                                                          Potery (NT1)
                 Evergreen (NT9)
                                                                                          Drama (NT2)
                BiblioteQ (NT10)
                                                                                          Fiction (NT3)
                OpenBiblio (NT11)
                                                                                          Short Stories (NT4)
                PMB (NT12)
                Liberty (NT13)
                                                                                English Literature (NT)
```

```
OPALS (NT14)
                                                                                              English Poetry (NT1)
   Virtual Library (RT)
                                                                                              English Drama (NT2)
        WWW Virtual Library (NT)
                                                                                              English Fiction (NT3)
                Agriculture (NT1)
                                                                                              English Short Stories (NT4)
                The Arts (NT2)
                                                                     Prose (NT)
                Business and Economics (NT3)
                                                                                Novel (NT1)
                Communications and Media (NT4)
                                                                                Novella (NT2)
                Computing and Computer Science (NT5)
                                                                                 Short story for Childrens (NT3)
                Education (NT6)
               Engineering (NT7)
                                                                                 Graphic novel (NT4)
               Humanities and Humanistic Studies (NT8)
                                                                                  Electronic literature (NT5)
               Information and Libraries (NT9)
                                                                                  Nonfiction (NT6)
               Natural Sciences and Mathematics (NT10)
                                                                        Histiography (UF)
               Recreation (NT11)
                                                                        Sanskrit Literature (UF)
               Regional Studies (NT12)
                                                                        Copyrighted (UF)
              Social and Behavioural Sciences (NT13)
                                                                        Hastinapura (UF)
              Society (NT14)
                                                                        Purana (UF)
Automated Library (RT)
```

IV. Creation of Formats for Thesaurus

These two technical formats are very useful for librarians and library automation, as advanced-level services can be provided through these systems. However, the temtrace tool is used here to create these two formats. The thesaurus is first created through this tool. Certain systems are used to create this thesaurus. After creating this thesaurus, it needs to be exported, so it is naturally clicked with the mouse at that location. Then the dropdown menu shows many advanced level formats. Since the primary goal of this research study is to develop the MARC21 and MADS formats, they are the two that are exported. Visitors can find many more format options that you may need here besides these two. The pull-down menu provides access to all of those options (Figure-1).



MARC21 for Thesaurus

MARC21 is a bibliographic standard used for library automation, enabling all types of entries. There are many fields and subfields so that all libraries can use them according to their needs. That is, with the help of this format, it will be possible to develop the entire automated library system because it is a very important concept among the elements that are needed to automate a library. So, with the help of TemaTres, this format is fully developed here and can be imported from one system to another. This MARC 21 format has been successfully developed, as demonstrated by this technical application. Then it was understood that it was possible to create a new format in this way. Here Figure-2 represents the MARC21 scripts has been generated by TemaTres.

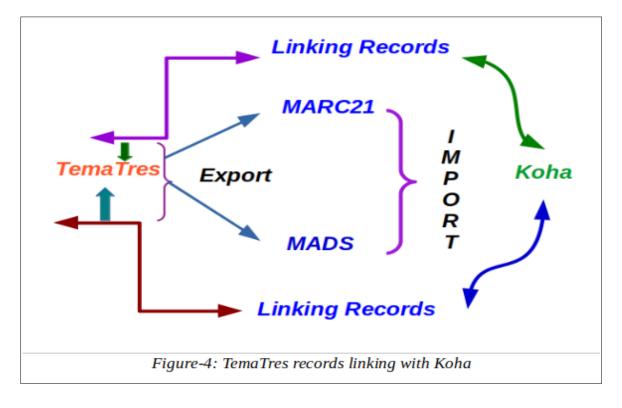
```
<?xml version="1.0" encoding="UTF-8"?>
<collection
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://www.loc.gov/MARC21/slim
http://www.loc.gov/standards/marcxml/schema/MARC21slim.xsd"
xmlns="http://www.loc.gov/MARC21/slim">
<leader>00415nz a2200121n 4500</leader>
<controlfield tag="003">OSt</controlfield>
<controlfield tag="005">20220803062939.0</controlfield>
<controlfield tag="008">171020|| aca||babn | a|a d</controlfield>
<datafield tag="040" ind1=" " ind2=
 <subfield code="a">OSt</subfield>
</datafield>
<datafield tag="150" ind1=" " ind2=" ">
 <subfield code="a">Academic search engines</subfield>
</datafield>
<datafield tag="550" ind1=" " ind2=" ">
 <subfield code="a">Research visibility</subfield>
 <subfield code="w">g</subfield>
</datafield>
</record>
              Figure-2: MARC21 records in TemaTres
```

MADS for Thesaurus

It stands for Metadata Authority Data Schema. It is used as authority data because it contains a wide range of authority-related information, which is critical for developing an integrated library system. This format is generally developed by the Library of Congress for XML Applications. These authority standards enable the creation of LCSH, such as the Authority Control System. This information can be easily imported from the authority server of any online library using the Z39.50 server. Here, TemaTres shows how such information can be generated and linked easily to other systems, which will greatly benefit library users. Using this same method, it is also possible to create the MADS format (Figure-3), which can easily import this data into other systems. This is how a modern library can be made and easily shared with people who use new digital services.

Figure-3: MADS records in TemaTres

After creating these two formats it is necessary to do integration with Koha because with its help two services can be provided simultaneously. The simple method of how to link the thesaurus records in TemaTres has been replaced by Figure-4. Using this system helps to collect data from two interfaces in a very short time. That is, it is proven that automated and digital library systems can be developed through thesaurus format. However, it can provide the most advanced technical services very easily.



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Significance of the System

Here is a very simple demonstration of how to construct a thesaurus and four main steps to follow to develop this entire system. First, the thesaurus subject repositories are studied, which makes it easy to understand how important it is to search terms. Therefore repositories of various types and subjects are essential which help a library in various technical aspects. Second, here is a comparative study where TemaTres supported all the parameters, so naturally that tool was selected to perform this task. This tool is very easy to install and configure in any operating system. However, the third idea is also very important because it explains how to build a thesaurus and all librarians can easily apply it. Through the fourth step, two formats have been created which help in providing modern automated and digital services. Howevere, the important findings of this study are explained as below:

- With this system, user can export based on a hierarchical list or an alphabetical list.
- Exporting is possible with organised and alphabetical methods that keep all the information in the PDF file in order.
- This system enables the export of thesaurus data between modules, and for this purpose, the services of the Learning Content Management System can be further improved.
- With this approach, the Zthes format can be created, which can provide more modern services to users.
- A popular format for providing linking services, called SKOS Core, is possible, making this service easily accessible to people in the community.
- Topicmap is an important format. This format can also be created using the same method, but for now, the help of themetrace is used to create it.
- TemaTres has also made it possible to create a format called BS8723, a very popular format in the field of digital libraries, through which new services can be provided.
- Authority Description Schema is an important format that can be used to improve library automation. So this format can also be created from here.
- MARC21 XML schemas can be created using TemaTres, which can be easily linked with Koha OPAC.
- TemaTres has made it possible to use both the Videx and WordPress Excel formats, which allows for integration with content management tasks.

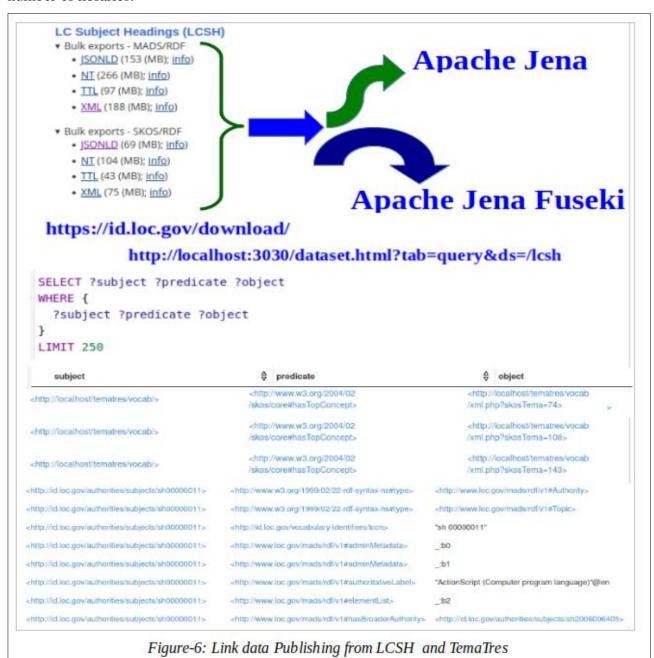
This system lets librarians export data in Sitemap and SQL formats, which is very helpful
for librarians because it makes it easy to back up databases and get to this data from other
interfaces.

It is possible to linking of TemaTres with Koha as shown in this diagram (*Figure-5*) will increase the library's information usage statistics as users will be able to easily find the information they need. So in addition to library automation, librarians can also deliver thesaurus services to users. Through this integrated system it is possible to provide more modern services. These services are closely related to Web 2.0 and linked open data because they rely on technical concepts. So to implement these concepts in libraries, open source software has to be taken.



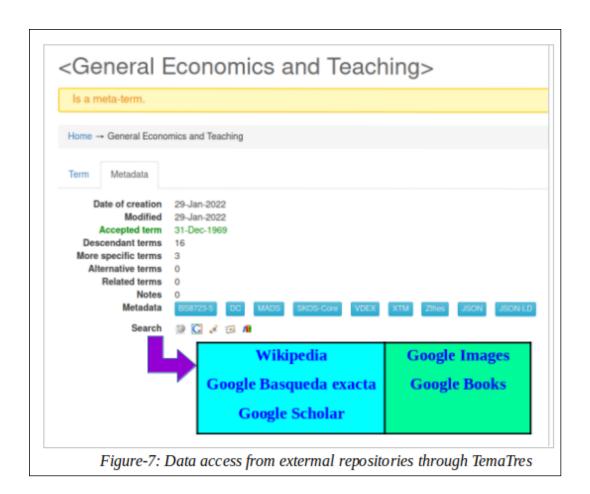
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It is possible to replace it with a technology method that is more advanced and contributes to the provision of digital services. With the assistance of Apache Jena and Apache Jena Fuseki, it is feasible to import thesaurus data from Library of Congress Subject Headings into this platform. Linked Open Data is typically thought of as being very closely related with this concept. As a consequence of this, in addition to being able to link to TemaTres and Koha, it may also link to additional repositories. With the assistance of this technology, libraries may simply deliver these services to patrons at any time in the past, present, or future. It is simple to comprehend, with the assistance of this illustration (Figure-6), how to deliver cutting-edge services to an increased number of libraries.



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Similar to the metadata in TemaTres, homogeneous information can be accessed from other digital repositories such as Google Books, Google Images, Google Scholar, and Wikipedia. That is, through this system, the required information can be extracted from the most popular repositories. Every user is greatly benefited by this modern service because they can find more information than the required information. These services are very useful in building a modern digital library. Figure-7 is a display window of metadata which shows the integration of external digital repositories.



Conclusion

Libraries can be further modernised through the proper use of modern technology with the help of which completely new types of digital reference services can be provided very easily. Generally, librarians have to face many technical problems to implement these systems and methods in the library. If librarians follow this approach, they will be able to implement it in their libraries very easily. So, from the above discussion, it is easy to understand how to convert the thesaurus data to MARC 21 and MADS format. However, this overall task can only be done successfully using TemaTres software. Using these two formats, thesaurus data can be easily imported into Koha, allowing users to get more of the information they need. It then became clear that librarians could

provide more modern services to users through an OPAC interface. Link data service is also an important aspect in modern library technology, so that it is possible to manage and publish these types of data for the library users. As a result, the use of information in the library will increase more than before. In addition to these two formats, many more sophisticated formats can be replaced by TemaTres, which are shown in the above illustrations. These sophisticated formats make it possible to provide digital linking services and, as a result, create better digital library repositories where users can easily find their relevant information. This system makes it easy to find additional metadata that is desperately needed to build a modern library. We all know that Google is a very popular search engine through which any information can be easily found very quickly. So naturally this research paper also shows that the method of extracting information from Google Books and Google Images through integration. This modern service will be very acceptable to every user now and in the future and its popularity will grow faster in the library.

References

- Bechhofer, S., & Goble, C. (2001). Thesaurus construction through knowledge representation. *Data and Knowledge Engineering*, *37* (1), 25–45. https://doi.org/10.1016/S0169-023X(00)00052-5 (Accessed on 17 September 2022)
- Bushman, B., Anderson, D., & Fu, G. (2015). Transforming the Medical Subject Headings into Linked Data: Creating the Authorized Version of MeSH in RDF. *Journal of Library Metadata*, 15 (3–4), 157–176. https://doi.org/10.1080/19386389.2015.1099967 (Accessed on 17 September 2022)
- Chunyan, L., Shuping, C., & Yucheng, W. (2007). The transformation from thesaurus to ontology based on SKOS. *Data Analysis and Knowledge Discovery*, 2 (5), 32-35. https://manu44.magtech.com.cn/Jwk_infotech_wk3/EN/10.11925/infotech.1003-3513.2007.05.08 (Accessed on 17 September 2022)
- Dalmau, M., Floyd, R., Jiao, D. and Riley, J. (2005). Integrating thesaurus relationships into search and browse in an online photograph collection. *Library Hi Tech*, 23 (3), 425-452. https://doi.org/10.1108/07378830510621829 (Accessed on 17 September 2022)
- Hedden, H. (2010). Taxonomies and controlled vocabularies best practices for metadata. *Journal of Digital Asset Management*, 6 (5), 279–284. https://doi.org/10.1057/dam.2010.29 (Accessed on 17 September 2022)
- Kaltman, E., Wardrip-fruin, N., Mastroni, M., Lowood, H., De groat, G., Edwards, G., Barrett, M., & Caldwell, C. (2016). Implementing controlled vocabularies for computer game platforms

- and media formats in skos. *Journal of Library Metadata*, *16* (1), 1–22. https://doi.org/10.1080/19386389.2016.1167494 (Accessed on 17 September 2022)
- Mayr, P., & Zeng, M. L. (2018). *Knowledge organization systems (Kos) in the semantic web: A multi-dimensional review.* https://core.ac.uk/works/47141966 (Accessed on 17 September 2022)
- Medelyan, O., & Witten, I. H. (2005). *Thesaurus-based index term extraction for agricultural documents*. https://core.ac.uk/outputs/29201791 (Accessed on 17 September 2022)
- Miles, A., Matthews, B., Wilson, M., & Brickley, D. (2005). SKOS Core: Simple knowledge organisation for the Web. *International Conference on Dublin Core and Metadata Applications*, 3–10. https://dcpapers.dublincore.org/pubs/article/view/798 (Accessed on 17 September 2022)
- Miles, AJ & Pérez-Agüera, JR (2009). SKOS: Simple Knowledge Organisation for the Web. *Cataloging & Classification Quarterly*, 43 (3-4), 69-83. http://purl.org/net/epubs/work/37578 (Accessed on 10 October 2022)
- Schneider, J. W. (2005). Verification of bibliometric methods' applicability for thesaurus construction. *ACM SIGIR Forum*, *39* (1), 63–64. https://doi.org/10.1145/10672 68.1067293 (Accessed on 10 October 2022)
- Shaghaghi, M. (2007). Review of online thesauri compilation methods. *Iranian Journal of Information Processing & Management*, 23 (1), 81–105. http://jipm.irandoc.ac.ir/browse.php?a_code=A-10-1-39&slc_lang=en&sid=1 (Accessed on 10 October 2022)
- Shiri, A. and Molberg, K. (2005). Interfaces to knowledge organization systems in Canadian digital library collections. *Online Information Review*, 29 (6), 604-620. https://doi.org/10.1108/14684520510638061 (Accessed on 10 October 2022)
- Somers, H. L. (1981). Observations on standards and guidelines concerning thesaurus construction. *Knowledge Organization*, 8 (2), 69–74. https://doi.org/10.5771/0943-7444-1981-2-69 (Accessed on 10 October 2022)
- Toma, E. (1971). The Structure of the Euratom-thesaurus. Journal of Documentation, 27 (4), 267-272. https://doi.org/10.1108/eb026521 (Accessed on 10 October 2022)