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What Is METS? How It Is Useful In Organizing E-Resources

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***Abstract*— Metadata is core of any information retrieval and so its implication for any digital library is profound. The management of complex digital objects is a crucial task for libraries, archives and museums. The correct representation of the digital collection requires objects to be maintained along the whole life cycle. At the same time, in order to avoid confusion and redundancy adequate means are needed to link specific metadata to objects. The Metadata Encoding and Transmission Standard (METS) help to handle digital objects to one intellectual entity. Mets is one of the Data format or technical standards, which is often a manifestation of a particular data strucure standard encoded or marked up for machine processing. METS helps to ensure the logical as well as the physical coherence of digital entities, supports subsets with special roles, supports the inclusion of hyperlinks, supports assignment of preservation methods, helps administrative metadata to organize the groups, helps in assigning me-tadata.**

***Index Terms*— Metadata, METS, Digital Library, Digitization; Digital Resources, Digital Preservation.**

I. INTRODUCTION

Digital library technologies are now well established and understood throughout the higher education community. The digital collection is either in the form of "Born digital" or "Digitization" of the Print Material. Internet has become the home for Digital resources production. With the advent of Web 2.0 technologies the digital collection has become more interactive concept with applications of blogs, wikis and folksonomies. Higher educational communities and special libraries which are engaged in Research are maintaining digital or institutional repositories as a vehicle for the dissemination of research output. Making use of such digital collection is dependent on the creation of Metadata. Metadata is nothing but "Data about data". It is like a Catalog. Though Metadata is core of any information retrieval and so its implication for any digital library is profound. The management of complex digital objects is a crucial task for libraries, archives and museums. The correct representation of the digital collection requires objects to be maintained along the whole life cycle. At the same time, in order to avoid confusion and redundancy adequate means are needed to link specific metadata to objects. The Metadata Encoding and Transmission Standard (METS) help to handle digital objects to one intellectual entity. Mets is one of the Data format or technical standards, which is often a manifestation of a particular data strucure standard encoded or marked up for machine processing.
The METS schema is a standard for encoding descriptive, administrative, and structural metadata regarding objects within a digital library expressed using the XML schema language of the World Web Consortium.

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II. Literature Survey Reviews

According Baca A standard for encoding descriptive, administrative and structural metadata relating to objects in a digital library expressed in XML. METS enables the packaging of complex digital objects that include a range of metadata as well as related digital surrogates. (Baca, 2008)
According to Gilliland METS developed by the Digital Library Federation and maintained by the Library of Congress, is increasingly being used for encoding descriptive, administrative, and structural metadata and digital surrogates at the item level for objects such as digitized photographs, maps, and correspondence from the collections described by finding aids and other collection- or group-level metadata records.(Gilliland, 2008)
METS was developed by the digital library Federation as an implementation strategy for preservation metadata. It is an XML document format for encoding metadata necessary for both management of digital library objects within a repository and exchange of such aspects between repositories. The MTES schema provides flexible mechanism for encoding descriptive, administaraitive and structural metadata for a digital library object and for expressing the complex links between varius forms of metadata. (Ramaiah, 2008)
According to Sukula, S " Metadata Encoding and Transmission Standard is refined and extended work on Mechanism for desribing technical, structral and administarative characterisics of digital objects. (Sukula, 2010)

III. History

METS was developed by Jerome McDonough. The digital library Foundation initiated METS and the standard is maintained by the Network development and MARC standards office of the Library of Congress.

IV. Characteristics Of Mets

- An open standard
- Non proprietary
- Extensible, Modular
- Developed by library community
- Structure of the METS is flexible and relatively simple.
- It allows users to choose a standard extension schema.
- It allows the metadata to reside outside the package.

V. Different Sections Of Mets

A METS document consists of seven major sections:

A. Mets header

This includes attributes like such as its creator, editor responsible for creating the record and the archivist responsible for the original material. etc. This metadata includes the date of creation for the METS document, the date of its last modification, and a status for the METS document. It may also include alternative identifier.

B. Descriptive metadata (<dmdsec/>)

It contains one or more elements. Each element contain pointer to external metadata, or an internally embedded metadata. Section records descriptive metadata for all items in the digital object- if necessary for each item separately. Multiple instances of both internal and external descriptive metadata may be included.

External descriptive metadata
Represented by <mdRef> . It provides a URI which is used to retrieve external metadata. This contains four attributes

- Loctype: Specify the type of locater contained in the body of the element
- Mimetype: Allows to specify the MIME type for the external descriptive metadata
- Mdtype: Allows indicating what form metadata is being referenced.

- Label: provides a mechanism for describing the metadata to those viewing a METS document, in a table of contents

Internal descriptive metadata
This provides a wrapper around metadata embedded within METS document like XML-encoded metadata or any arbitrary binary or textual form.

C. Administrative metadata (<amdsec/>)

Provides information regarding how files were created and stored, intellectual property rights, metadata regarding the original source object from which the digital library object derives, and information regarding the provenance of files comprising the digital library object (such as master/derivative relationships, migrations, and transformations). As with descriptive metadata, administrative metadata may be internally encoded or external to the METS document.
There are four main forms of administrative metadata provided for in a METS document:

- Technical Metadata
- Intellectual Property Rights Metadata
- Source Metadata
- Digital Provenance Metadata

File section (<filesec/>)
Lists all files containing content which comprise the electronic versions of the digital object. File elements may be grouped within fileGrp elements to subdivide files by object version.
An Example of a file section from a digital Library Object for an oral history which has three different versions: a TEI-encoded transcript, a master audio file in WAV format, and a derivative audio file in MP3 format: is given below

Structural map (<structmap/>)
Outlines a hierarchical structure for the digital library object, and links the elements of that structure to associated content files and metadata. The Structural Map is the only section required for all METS documents.

D. Structural links (<structLink/>)

Allows METS creators to record the existence of hyperlinks between nodes in the Structural Map. This is of particular value in using METS to archive Websites.A METS document for a web page containing an image which is hyperlinked to another page.

E. Behavioral (<behaviorSec/>)

Used to associate executable behaviors with content in the METS object. Each behavior has a mechanism element identifying a module of executable code that implements behaviors defined abstractly by its interface definition.Digital object behaviors can be implemented as linkages to distributed web services

VI. WORKING

Borghoff, U. M and others explains
METS is a conceptual framework for describing complex object structure and for linking content with administrative and descriptive metadata. In addition it provides means to link definitions of behavior and program code to digital content and associated metadata. METS helps to ensure the logical as well as the physical coherence of digital entities. Files can be bundled into groups and subgroups in order to glue together all members of a digital entity. METS also supports subsets with special roles. E.g different manifestations. In addition standard allows objects to be arranged in hierarchies of arbiter depth. METS supports the inclusion of hyperlinks to address subsections of files. For instance, marked up with begin time and end time tags respectively. METS allows to specify relations for the order of processing. It includes wrapping techniques. METS objects can directly host, digital content either as binary code or as XML object. METS offers a rich set of flexible features for assigning metadata. There are two basic options for the metadata assignment which can be used side by side. One option is to store the metadata in an external object and let a URL point to that object. The other option is to store the metadata directly in an METS object. This option allows metadata to be incorporated as binary data, or, alternatively in an XML format.e.g. Dublin

core. For a finer degree of granularity, metadata may be linked to single content element. This increases the flexibility of the METS approach even more. File groups and subfile structures can point to administrative metadata. Files and any node within an object hierarchy can point to descriptive metadata. Both categories of metadata can point to descriptive metadata. Both type of metadata refer to administrative metadata. This feature supports the assignment of preservation metadata to current metadata.
METS helps administrative metadata organize into four groups.

- Technical Metadata
- Intellectual property Rights Metadata
- Source Metadata (for descriptive and administrative metadata of analog sources
- Digital Preservance Metadata
- The assignment of executable behavior to digital content extents the expressive power of METS. This feature comprises the definitions of two references that point to external objects. The first interface provides abstract definitions of the behavior and the second behavior mechanism contains the direct implementation of the intended behavior. Alternatively, the behavior mechanism may refer a service. (Borghoff, 2003)

VII. USES

- METS is used to collect digital resource metadata for submission to the repositories
- METS serves as the place for the metadata within the repository
- METS act as the supplier of information to the tools that provide the resources to the patrons.

Some projects that use mets are

- The Library of Congress is using METS for a very large body of moving image and audio material and other mixed media folk life resources
- The National Library of Wales is using METS initially for textual material
- Harvard is experimenting with audio collections
- Michigan State is working with moving images.
- Both OCLC and RLG are working METS into their digital projects.

VIII. CONCLUSION

Library professional are trying to adopt new technologies to mainatain collection development and provide quality services. Digital library is one of such objects. Digital library collection includes Born Digital and Digitised information sources. The technology of the digital library offers greater potential for Inter institutional collaboration and multiple collections can be renderedccross searchable in the form of Union catalogue rather the objects that constitute these collections can themselves be integrated into inter institutional digital repositories. To do so effectively there is a need for standard approach to Metadata. METS is one of such standards.It offers a rich set of elements for expressing complex relations between content objects as well as between content objects and metadata. METS also helps to create machine readablespecifications of Information Packages such as SIP (Submission Information Package), DIP (Dissemination Information Package) and AIP ((Archival Information Package). Efficient and consistency would greatly support the long term preservation of complex objects.

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