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`Digital Preservation: Strategies and Standards with Special Reference to Dublin Core

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INTRODUCTION

- In electronic era cultural and Heritage martial digitized form.
- For to provide quick access.
- Digital preservation is for the benefit of present and future generation.
- Any paper record can be perceived through the five human senses.
- Digital record perceived going through the computers hardware and software.
- Hence the speed technological obsolescence makes digital preservation an important issue for every one.
- It is finding ways in the form of e-journals, data bases, records, websites, Mails, digital, Images, Audiovisual, materials, interactive programmes or any other kind binary data.
- Encompasses a broad range of activities designed to extend the usable life of machine readable computer.
- "Computer files and protects them from media failure, physical loss and obsolescence".
- Kelly Russell define "Preservation is process by which digital data is perceived in digital form in offer to ensure the usability, durability, and intellectual integrity of the information contained there in.
- "The storage maintenance and accessibility of a digital over the long period."

DIGITAL MATERIAL:

- Have immense capacity to record information.
- To provided users seem less access to information.
- It is very fragile in comparison to print media.
- Data i.e. text, image, video or audio.

PRESERVATION OF MEASURES:

- Integrity of digital materials.
- Thy physical presence.
- The preservation format.
- The digital materials functionality.
- Location and reference of digital materials.
- The authenticity of that materials and the provenance.

STRATEGIES:

1. **Technological preservation**: aims at preserving the software and hardware environment that was used to access the resource when it was created. (With original hardware and software on which it depends)
2. **Refreshing:** Involves periodically moving a file from one physical storage media to another to avoid physical decay or obsolescence of that medium.
3. **Intellectual Preservation:** Printing of digital materials into a hard copy. But this approach does not seem to be a viable solution.
4. **Date Migration:** Data is transferred whole sale from one hardware/software configuration to another without attempting to imitate the original.
5. **Simulation:** (The original Hardware/Software environment).
6. **Emulation**: it refers to creating new software that mimics the operation of older, hardware or software in order to reproduce it performance rather than looking backwards in time to the old technology.
7. **Encapsulation**: This approach retains the records in its original form, but encapsulates it with a set of instructions on how the original should be interpreted.

Standardization is the secret behind quality uniformity of measurement, Norms, terminology which directly affect mass production that leads to economy of time, space, efforts, materials, manpower and money and facilities and acts as a tool of transfer of information.

STANDARDS FOR PRESERVATION CONTENT:

PDF (Portable Document Format)

- It is facto document standard.
- Uses the image model of the post script language.
- Two types of format – a) Text based PDF out line font technology of post script PDL (Page description Language) for describe format of page. b) Roster scanned image PDI without line for OCR (Optical Character Reorganization).

MARC

- (Machine Readable Catalogue) representation and communication of bibliographic and relation and Definition in machine readable forms,
- It is starting print for metadata description.
- MARC is industry wise standard therefore it facilitated permanent access to records.

Standard for Interoperability:

- Ability of multiple systems with different hardware/ software platform.
- Data structure and interface to exchange data with minimum loss of content and functionality.

DMA (Document Management Alliance):

It tries to solve problem of island of information that created different proprietary DMS (Document Management Software).

- Create bridges between these Islands on protocol level.

Web DAV (World Wide Web distributed authoring and Versioning):

- Enables author to write (Upload) Document element by extending HTTP Protocol.
- It is also enables distributed network environment (web DAV; 2007)

DUBLIN CORE TAGS:

Introduction:-

- Due to electronic or digital environment.
- Information increases/information explosion.
- Search the relevant & right informati9on.
- Effected & efficient way.
- To meet / fulfill this need Meta data is only option.
- Metadata latest approach.
- For help to find a standardized method.
- Various Metadata standards.

Concepts of Metadata:

Metadata means- data about data or information about information for example:- a catalogue card of library contains information (metadata) about publication (data).

A file maintains permissions (metadata) about files (data).

Machine understandable information.

It only for records that describe digital or electronic resources.

Help support a wide range of operation.

Resources description and discovery, management.

Long term preservation of digital information resources.

Definitions of Metadata:

- "Machine – understandable information about web resources or other things" – Time -Berners Lee, W3c (1997).
- "Structured data about resources that can be used to help support a wide range of operations" – Michael Day, (1977).

- "Structured information that describes, explains, located or otherwise makes it easier to retrieve, use of manage." – National Information standard organizations (2004).
- "Data associated with objects which relives their potential users of having to have full advance knowledge to their existence or characteristics". – Dempsey and Harry, (1998).
- "Meaningful data describing another discrete data objects" – Gill (1998).
- "Meta data is a structured, encoded description of an information package. Metadata provides an intermediate level at which viewing or searching choices can be made in light of data characteristics like content, quality, condition and usage. Metadata also enables administrators to manage information packages and control access to them." – Mark Watson.

Kinds Metadata:

1. Descriptive Metadata

- Used for to describe or to identify information resources.
- Title, author, abstract, keywords etc.

2. Structural Metadata

- It describes the relationship within or among related Title, author, abstract, keywords etc.
- Compound objects, put together (Chapter to book)

3. Administrative Metadata

- Used for Managing and administering information resource.
- This Metadata includes
- **i) Right Management Metadata**
- It deals with Intellectual Property Rights.
- **ii) Technical Metadata**
- It object's file characteristics or the chapter or encoding process used in creating the resources i.e. how a system function or how the Metadata behave.
- **iii) Preservation Metadata**
- Preservation and Management of Information resource.

Goals of different types of Metadata:

The goals of metadata with sample elements and sample implementation are given as below:

1. Describing and identifying information resources.
2. At the local level to enable searching and retrieving (searching an image collection to find painting of animals).
3. At the web level, enables the users to discover resources (e.g. search the web to find digitized collection of some things).
4. Facilitates navigation and presentations of digital or electronic resources.

5. Provide information about the internal structure of resource including page, section, chapter, numbering, indexes, table of contents etc.
6. Describe relationship among items materials.
7. Facilitates both short-term and long-term management and also processing of digital collection.
8. Include technical data on creation and quality control.
9. Include right management, access control and use requirements.
10. Preservation action information.

FUNCTIONS OF METADATA:

1. To facilitate and improve the retrieval.
2. Resources discovery in digital library environment.
3. Organize digital or electronic Resources.
4. Facilitate interoperability and legacy resource integration.
5. Provide digital identification.
6. Support archiving and preservation.

Resource Discovery:

Metadata serves the same functions in resource discovery as in catalogues by:

1. Allowing digital resources to be found by relevant criteria;
2. Identifying digital resources;
3. Bringing similar resources together:
4. Giving right location information.

Organizing Digital Resources:

- Growth in the number of web-based resources, portals and Gateways.
- Links to resources.
- List and relevant resources ca be incorporated into static web pages. **HTML** encoded Names **and Locations.**

Interoperability:

- Metadata allows for Possibility of exchange of information.
- Multiple systems constituted of different Hardware and Software Platform, data structures and interfaces.
- Schemes and shared transfer protocols and crosswalks between schemes, resources across the network.
- Two interoperability approaches.

1. Cross System Search

- Example – Z39.50 Protocol
- In this Protocol, Partners do not share Metadata.
- Map their own capabilities to a common set of search attributes.
- Open Archives Initiative (www. Openarchives.org) developed a protocol **(OAIPMH)**
- Requires partners to translate native Metadata.
- Common core set of elements & expose this for harvesting.

1. Metadata Harvesting

- Digital Identification
- Standard numbers to uniquely identify the object.
- Using file name.
- **URL** (Uniform Resource Locator)
- Some more persistent identifier
- **PURL** (Persistent Uniform Resource Locator)
- **DOI** (Digital Object Identifier)
- Archiving & Preservation
- Digital resources will survive & continue to be accessible into the future.
- Special elements to track the linkage of digital object.
- Physical characteristics.
- To emulate it on future technologies.
- Verification authenticity, intellectual property Management, content rating.
- Authentication & authorization of digital information resources.

Metadata Structure

- Metadata schemes
- Set of elements or attributes for information resources.
- Specify names of elements and their semantics.
- Syntax rules encoded in any structured syntax.
- **SGML** (Standard generalized mark up language)
- **XML** (Extensible Mark – Up language)
- **SGML** is super set of both **HTML** & **XML**
- **XML** is an extended for **HTML**
- **HTML** : developed by the world wide consortium **(W3C)**

- **XML**: tag set & easy exchange of structured information.
- Subset of **SGML.**
- Designed for web context
- Universal format, not only for business application, but also for effective knowledge of information management.

Meta data standards

Large No of metadata initiatives, formats, schemes, are available in the digital environment.

Definition

- It is set of metadata elements with associated semantics and syntax for describing a particular type of digital resources.
- Set of named components (terms, element etc.)
- Instant in a digital format
- There are deferent types of metadata standards are in operations for different purposes. It has some advantages disadvantages.
- In practical field it is noticed that noticed that Dublin core Metadata is very much popular.

Dublin core

- Evolved from the discussion of 1995 work shop
- Sponsored by OCLC & National center for super computing applications (NCSA)
- The name Dublin core was given as the workshop was held in Dublin, Ohio.
- The Dublin core metadata Initiative **(DCMI)**
- Manages the continuing development of the Dublin core & related specifications.

Basic Elements of Dublin core

Element	Description	Example
Tile	Name of resource	<meta name=”D.C. Title” Content = “ Library Classification”>
Creator/ Author	Who is primary responsible for creating the content of resource	<meta name=”D.C. Creator” content=” “Ranganathan, S.R,”>
Subject	The Topic of the content of the resource	<meta name=”D. C. Subject” Content=” Library Science”> <meta name= “DC. Subject” Scheme= “ddc”

		content=”020”>
Description	About the content of the resource	<metadata name= “DC. description” Lang= “en” content=”The author presents a brief description regarding library science”>
Publisher	Who is responsible for making the resource available	<meta name + “D.C. Publisher” Content= “MIT press>
Contributor	Who makes contributions	<meta name= “DC. Contributor”
	to the content of resource	content= Jana, S.K”>
Date	Date associated with the resource	<meta name= “DC Date” Content= “1996”> <meta name= “DC Date” Accepted” Content =”2000-12-06T15:45”>
Type	The nature or genre of the content of the resource	<meta name = “DC. Type” Content = “ drama”>
Format	The physical or digital manifestation of the resource	<meta name = “DC. Format” Content = “text/xml”> <meta name = “DC. Format content + “/image/jpeg”>
Identifier	A unique reference to the resource within a give context	<meta name = “DC. Identifier” Content = “Scheme= “URI” content= http://www.google.com/>
Source	A reference to a resource from which the present resource is derived	<meta name = DC Source” = content= http://xyzorg/abc/>
Language	The language of the intellectual content of the resource	<meta name= “DC. Language” content= “en”
Relation	A reference to a related resource	<meta name = “DC. Relation. Is part of” content= http://foo.bar.org/abc/proceedings/2000/”>
Coverage	The extent or scope of the content of the resource	<meta name = DC. Coverage” content= “US Civil war era; 1861-1865”>
Rights	Information about rights held in and over the resource	<meta name = “DC> Rights” content= http://foo.bar.org/cigbin/items>
Audience	A class of entity for	<meta name=”DC.udence ”content=

	whom the resource is intended or useful	"postgraduate students">
Rights holder	A person or organization owning or managing rights over the resource	<meta name= "DC. rights Holder" content= "John Brothers Limited">

Objective

- To define a set of elements that could be used by authors.
- To describe their own web resources.
- Faced with a proliferation of electronic resources.
- In ability of the library profession to catalog all these resources.
- The goal was to define a few elements & some simple rules that could
- be applied by non- catalogers.
- The original 13 core elements
- Then increased to 15 & presently 17
- Title, creator, subject, description, publisher, contributor, date, type, format, identifier, source, language, relation, coverage, rights, audience and rights holder. These 17 element set of internet resources.

Conclusion

The World Wide Web has created a revolution in the accessibility of digital information resource will survive and continued to be accessible in to the future. It can be embedded in a digital object or it can be stored separately like library catalogue.

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