

Metadata Crosswalks as a Way Towards Interoperability

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INTRODUCTION

Metadata is data about data (Dublin Core Metadata Initiative [DCMI], 2014). Metadata facilitates discovery of relevant information, helps in organizing electronic resources, facilitate interoperability and legacy, resource integration, provide digital identification and support archiving and preservation (National Information Standards Organization [NISO], 2004). Metadata is a summary document providing content, quality, type, creation, and spatial information about a data set. It can be stored in any format such as a text file, Extensible Markup Language (XML), or database record. Because of its small size compared to the data it describes, metadata is more easily shareable (Environmental Systems Research Institute, [ESRI], 2002). Recognition of the many uses of metadata has led to the construction of a very broad typology of metadata as being descriptive, administrative or structural (Caplan, 2003). Metadata Standards are sets of topic-specific norms that guide the collection and documentation of metadata resulting in consistent collection criteria, nomenclature, structure and enable interoperability (Hogrefe & Stocks, 2011).

Interoperability is the ability of multiple systems with different hardware and software platforms, data structures and interfaces to exchange data with minimal loss of content and functionality (NISO as cited by Zeng & Qin, 2008). Metadata interoperability is a qualitative property of metadata information objects that enables systems and applications to work with or use these objects across system boundaries (Haslhofer & Klas, 2010). Interoperable metadata allows multiple

systems to work with the same set of data and metadata. It helps ensure metadata records associated with one resource can be accessed, accurately interpreted and subsequently used by a system or integrated with metadata records associated with other resources (Neiswender & Montgomery, 2009). In order to maintain interoperability across related metadata standards, it is necessary to create software systems able to process several metadata dialects or provide crosswalks between metadata standards. Crosswalks support the ability of search engines to search effectively across heterogeneous databases, i.e. they promote interoperability (Nogueras-Iso, Zarazaga-Soria, Lacasta, Bejar, & Muro-Medrano, 2004). Crosswalks (sometimes called “tag mapping” or metadata translation”) are used for “translating between metadata formats. Dublin Core Metadata Glossary views crosswalks as a table that maps the relationships and equivalences between two or more metadata formats. The technological universe of crosswalks, mapping, federated searching of heterogeneous databases and aggregating metadata sets into single repositories is rapidly changing. Crosswalks and metadata mappings are still at the heart of data conversion projects and semantic interoperability which enables searching across heterogeneous resources (Woodley, 2008). Crosswalks can apply to content standards, vocabularies, or both and Crosswalking is generally done when datasets using different metadata standards or vocabularies need to be integrated (Wang, Isenor, & Graybeal, 2011). Metadata schemas are sets of metadata elements designed for a specific purpose, such as describing a particular type of information resource (NISO, 2004). It is a mapping of elements,

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semantics and syntax from one metadata scheme to another. The elements of one metadata set are correlated with the elements of another metadata set that have the same or similar meaning (Godby, Young, & Childress, 2004). The process is also sometimes called as “semantic mapping” since it essentially provides mapping of metadata elements from one standard to another (Shah & Arora, 2009).

A crosswalk allows metadata created by one community to be used by another group employing a different metadata standard (Hodge, 2004). They are not only important for supporting the demand for “one stop shopping” or “cross domain searching,” they are also instrumental for converting data from one format to another (Baca, 2008). They play a significant role in repurposing and transforming metadata. The repurposing process covers a broad spectrum of activities: converting or transforming records from one metadata schema to another, migrating from a legacy schema, integrating records created according to different metadata schema and harvesting or aggregating metadata records that has been created using a shared community standard thus facilitating universal availability of records. Development of crosswalks therefore requires in-depth knowledge in associated metadata standards. Crosswalks can act as better tools for integrating knowledge resources for maximum use.

BACKGROUND

The last few years of the “Metadata Movement,” has included the development of general application metadata schemas, such as Dublin Core, Government Information Locator Service (GILS), or Digital Object Identifier (DOI), as well as domain-specific metadata schemes, such as Text Encoding Initiative (TEI), Encoded Archival Description (EAD), Consortium for the Interchange of Museum Information (CIMI), Visual Resources Association (VRA), etc. Such schemes are based on a common “machine-readable” syntax, such as Hypertext Markup Language (HTML), Standard Generalized Markup Language (SGML), or eXtensible Markup Language (XML). Metadata-enabled search engines can thus retrieve by precise metatags and values, those electronic resources in which a metadata record

is embedded, or to which a separately housed metadata record points Baker (as cited by Howarth, 2000).

Metadata crosswalks facilitate such information systems that require integration of different types of metadata sets for providing a single point access to multiple resources. Crosswalks have emerged in a very rapid manner for different types of metadata sets like library, Geographic data, Multimedia, Events, and Culture etc. In order to bring them together, integration process has become another emergent area where work is very meager. The UK Office for Library and Information Networking, (UKOLN), University of Bath lists about Twenty five metadata mappings between metadata formats like MARC21 to Dublin Core, Dublin Core to danMARC2/GILS, Dublin Core to EAD, Dublin Core to EAD/GILS/USMARC, Dublin Core to IAFA/ROADS templates, Dublin Core to UNIMARC, Dublin Core to Z39.50 tag set G, EAD to ISAD(G), IAFA/ROADS templates to Dublin Core, IAFA/ROADS templates to USMARC, IAFA/ROADS templates to Z39.50 Bib-1 Attribute Set, SOIF to IAFA/ROADS templates, SOIF to Dublin Core, GILS Core Elements to GCMD DIF, GILS Core Elements to USMARC, FDGC to GCMD DIF, FGDC to USMARC, ISAD(G) to EAD, ISAD(G) to SPECTRUM, TEI header to USMARC, TEI header to USMARC/Dublin Core, USMARC to EAD, USMARC to FGDC, created by well known institutions like Library of Congress, Danish Library center, Getty Information institute, UKOLN, Helsinki University Library etc (Day, 2002). OCLC lists crosswalks other than Dublin Core and MARC like crosswalk between Canadian Core Learning Resource Metadata Application Profile (CanCore) and The Sharable Content Object Reference Model (SCORM), ONIX to MARC21, Learning Object Metadata (LOM) to Dublin Core, The Gateway to Educational Materials (GEM) to MARC (Godby, 2002). DET Learning Resource Metadata Crosswalks facilitate search across metadata records created according to application profiles and the transformation of metadata from one to another. DETLRM data elements can also be crosswalked to Dublin Core, Australian Government Locator Service (AGLS) and Education Network Australia (EdNA) metadata elements (DET Learning Resource Metadata [DETLRM V2.0], 2010).

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