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Development of an Integrated VRA Core Framework for Libraries

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Abstract

Metadata is one of the important concept in the field of digital technology throughout the higher education as well as research environment. Digital resource management is possible through open source standard and tool. This paper has select the metadata standard like Visual Resource Association (VRA) Core. Now the methodology is very simple to perform and add the different items in this system. Integrated this VRA Core metadata framework with the Omeka open source software for the better management of library resources. Apart from this it is also manage the Museum for cataloguing the different images with suitable metadata. This integrated framework is very user-friendly for easy install and configure the metadata with fulltext documents and also display the ngram view with sequence graph of different metadata available in the database.

Keywords : VRA Core, Metadata, Omeka, Digital Library, and Open source tool

Introduction

Libraries have a strategic interest in the tools and technologies that facilitate the discovery of and access to the resources for the communities that they serve. Creating a rubric of core functionality and rating two discovery layers based on criteria in four main categories: general features and functionality. The fast technological development in recent years, particularly in the area of digital, multimedia and telecommunications, have significantly chaged the way generate, collect, organize, present, disseminate, share and use information. These have sharply increasing the alternatives of fast and effective access to information of all kinds. This will certainly have a significant impact on the contemporary role of all types of libraries. The libraries will include all the processes and accommodations that are the backbone and nervous system of libraries. Cataloguing is one of the crucial things in any type or size of a library. Most of the libraries are using the manual cataloguing but some library using the machine generated cataloguing. Therefore, such classical or traditional tools and techniques have to be revised and enhancing in the field of digital media and file formats. One of the most immensely colossal issues in engendering digital libraries will be the building of digital accumulations. Conspicuously, for any digital library to be viable, it must eventually have a digital amassment with the critical mass to make it genuinely subsidiary. One thing digital libraries will not be is a single, consummately digital system that provides instant access to all information, for all the students of college libraries and also from anywhere in the world. This is simply unauthentic. This concept emanates from the early days when people were nescient of the intricacies of building digital libraries. Instead, they will most likely be a amassment of disparate resources and disparate systems, catering to concrete communities and utilizer groups, engendered for concrete purposes and include, perhaps indefinitely, paper-predicated accumulations. Again interoperability and crosswalked of different metadata structures in digital libraries and document formats — will only likely be possible within relatively bounded systems developed for those concrete purposes and communities. In this research work three popular digital library software that can create and manage the digital environement in college libraries. It is helpful both for the students and librarians also because they have to access, download and upload the relevant documents. This paper has select one global metadata standard such as Visual Resource Association (VRA) Core. Apart from this the whole framework is developed through Omeka open source software. VRA Core is developed by in 1996 written in XML language which support the interoperability and exchange of metadata records. It is a well known internationally metadata standard for designing the works of visual culture and images in different objects including paintings, drawings, sculpture, photographs, monograph, theses, journals, performance art and decorative documents. It is fully support the Metadata object description schema for managing the resources of cultural heritage. Currently the data has been used in many organizations and institutions such as school, college, university, museums, libraries, archives for managing and access the digital resources. Now, VRA Core data model consists of three elements such as collection, work, and image (Figure – 1). Now, this research paper explores the process of image cataloguing and their indexing also because the image cataloguing is one of the important aspects in all types of library. The html form and size lets for better application of look for powers such as full-text looking for and stemming and Document managers system is a system used to unbroken bands over wheels for moving over rough earth, manage and store documents and get changed to other form paper to able of keeping a record of the different accounts made come into existence and made an adjustment by different users. The data model of VRA Core is represents in the Figure – 1 for aggregate the multiple collection of image records.

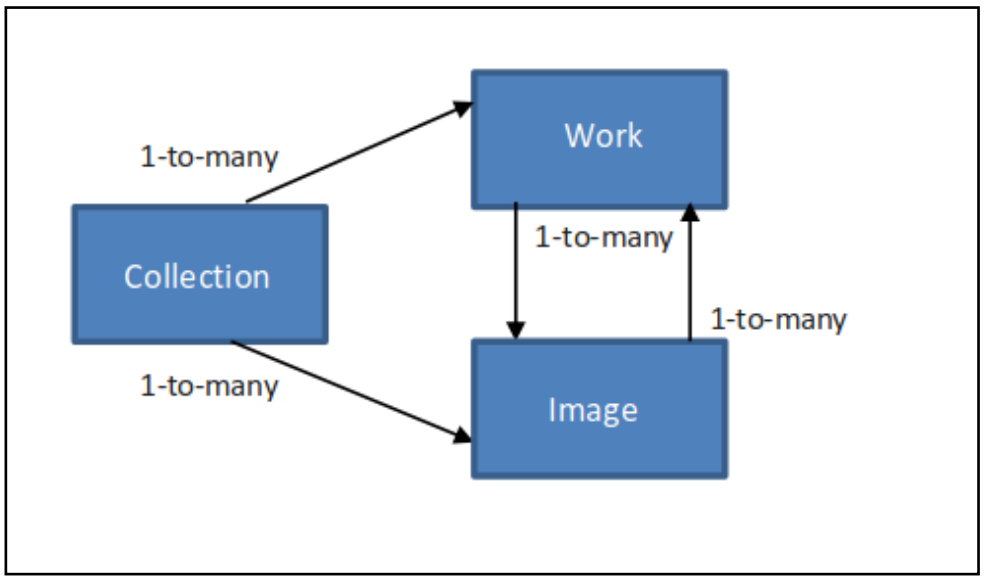


Figure – 1: Data Model of VRA Core
[Source :https://www.loc.gov/standards/vracore/]

Objectives

The core objectives of VRA element sets are explained as follows:

(i) To explore the open source software Omeka for the management of digital resources.

(ii) To explore the Visual Resource Association element sets for the development cataloguing in different libraries, museums, and institutions.

(iii) To display the ngram view or sequence graph for frequency terms and associated words available in the database for easy management and retrieving of digital resources among the users.

Review of related literature

Pal in 2010 discusses the few emerging tools and techniques for the development of metadata resource discovery services in a distributed network environment. It aims to highlight a brief description of the major metadata initiatives has been taken during the last few years, thus provide glimpses of recent activities on metadata across the globe. Apart from this It also discuss a consistent growth of multiple metadata standards to meet the variety of needs in a hierarchy of complexity. The comparison of metadata standards is to be made on the basis of the some well known tools and standards. This study shows a detailed analysis of the metadata standards available worldwide and it will help in comparing and adopting the required standard for the institutional digital repositories (Anil Hirwade, 2011). This is the new and first study to display how FRBRoo can play a role as a shared ontology to integrate the heterogeneous metadata generated by museums and libraries. This paper also shows how the proposed approach is distinct from the Dublin Core format crosswalk in re-contextualizing semantic meanings and their relationships, and further provides four new sub-types for mapping description language (Chen & Ke, 2013). The approach addresses metadata normalization in the context of web resources. The automatic classification approach accounts for matches within hierarchies, aggregating lower level matches to broader parents and thus approximates the practices of a human cataloger (Khoo & et.al, 2015). Commonly,

an organizational information system may have various data types and directory formats. It usually employs different metadata formats to represent the documents. Although the metadata system can cover the different formats of documents, there still exist the integration problems in various metadata systems (Yu, Lu & Chen, 2003). The purpose of this paper is to examine how users describe images and to ascertain whether differences exist between users and librarians in creating metadata on images (Petek, 2012). This study aims to explore how metadata have been applied in GLAM (galleries, libraries, archives and museums) institutions in New Zealand (NZ) and to analyse its overall quality with the interoperability of the metadata element set especially in mind (Lim, & Li Liew, 2011). The purpose of this paper is to introduce digital librarians to a new encoding standard for developing semantically-rich controlled vocabularies which will enhance searching of digital content (Cantara, 2006). The aim of this research was to examine the use of the data island method for creating metadata records based on DCXML, MARCXML, and MODS with indexability and visibility of element tag names in web search engines (Taheri, Hariri & Fattahi, 2014). Preserving the vast amount of digitally published data is of paramount importance to maintaining the intellectual heritage. In order that resources can be deposited, managed and retrieved, it will be necessary to accurately describe what has been preserved and how it has been preserved. This paper looks at the problems of producing accurate and effective metadata that describe preserved resources without incurring a prohibitive cost overhead (Brindley, Muir & Probets, 2004).

Core elements of VRA Core

Visual Resource Association Core is consists of 19 core elements such as id, title, agent, cultural context, date, description, inscription, location, material, measurements, relation, rights, source, state edition, style period, subject, technique, textref, and worktype. Again these can be further classified in sub-categories which represents in the Table – 1. These elements are also known as restricted and unrestricted standards in the field of metadata for the management of images, collections, and digital resources.

Table – 1 : Elements of Visual Resource Association (VRA) Core

A.1	**ID**							
B.1	**Title**		C.1	**Agent**		D.1	**Cultural Context**	
	B.11	Display attributes[1]		C.11	Display attributes[1]		D.11	Display attributes[1]
	B.12	Notes		C.12	Notes		D.12	Notes
	B.13	Notes attributes[1]		C.13	Notes attributes[1]		D.13	Notes attributes[1]
	B.14	Title elements		C.14	Agent attributes and subelements[2]		D.14	Cultural Context elements
	B.15	Attributes[1]					D.15	Attributes[1]
E.1	**Date**		F.1	**Description**		G.1	**Inscription**	
	E.11	Display attributes[1]		F.11	Display attributes[1]		G.11	Display attributes[1]
	E.12	Notes		F.12	Notes		G.12	Notes
	E.13	Notes attributes[1]		F.13	Description elements		G.13	Notes attributes[1]
	E.14	Date attributes and sub-		F.14	Attributes[1]		G.14	Inscription attributes and

		elements[3]						subelements[4]
H.1	**Location**		I.1	**Material**		J.1	**Measurements**	
	H.11	Display attributes[1]		I.11	Display attributes[1]		J.11	Display attributes[1]
	H.12	Notes		I.12	Notes		J.12	Notes
	H.13	Notes attributes[1]		I.13	Notes attributes[1]		J.13	Measurements elements
	H.14	Location attributes and subelements[5]		I.14	Material elements		J.14	Attributes[1]
					Attributes[1]			
K.1	**Relation**		L.1	**Rights**		M.1	**Source**	
	K.11	Display attributes[1]		L.11	Display attributes[1]		M.11	Display attributes[1]
	K.12	Notes		L.12	Notes		M.12	Notes
	K.13	Notes attributes[1]		L.13	Notes attributes[1]		M.13	Notes attributes[1]
	K.14	Relation elements		L.14	Rights attributes and subelements[6]		M.14	Source attributes and subelements[7]
	K.15	Attributes[1]						
N.1	**State Edition**		O.1	**Style Period**		P.1	**Subject**	
	N.11	Display attributes[1]		O.11	Display attributes[1]		P.11	Display attributes[1]
	N.12	Notes		O.12	Notes		P.12	Notes
	N.13	Notes attributes[1]		O.13	Notes attributes[1]		P.13	Notes attributes[1]
	N.14	Style period elements		O.14	Style period elements		P.14	Subject attributes and subelements[8]
	N.15	Attributes[1]		O.15	Attributes[1]			
Q.1	**Technique**		R.1	**Textref**		S.1	**Worktype**	
	Q.11	Display attributes[1]		R.11	Display attributes[1]		S.11	Display attributes[1]
	Q.12	Notes		R.12	Notes		S.12	Notes
	Q.13	Notes attributes[1]		R.13	Notes attributes[1]		S.13	Notes attributes[1]
	Q.14	Technique elements		R.14	Textref attributes and subelements[9]		S.14	Worktype elements
	Q.15	Attributes[1]					S.15	Attributes[1]

1. Extent, href, pref, refid, id, rules, source, vocab, and xml:lang
2. Agent attributes, Name, Culture, Dates, Role, Attribution
3. Date attributes, Earliest date, Latest date
4. Inscription attributes, Author, Position, Text
5. Location attributes, Name, Refid
6. Rights attributes, Rights holder, Text
7. Textref attributes, Name, Refid
8. Source attributes, Name, Refid
9. Subject attributes, Term

VRA Core Interface

The interface of VRA Core is very user-friendly and relevant to the library professionals and users. All the elements and sub-elements of VRA Core have successfully integrated with the Omeka open source software. The Figure – 2 is represents the VRA Core interface in Omeka. Actually it is a data entry framework for designing and developing of an integrated framewrok for libraries and institutions. It can be create against in two things such as item and collection for access both the public as well as admin interfaces.

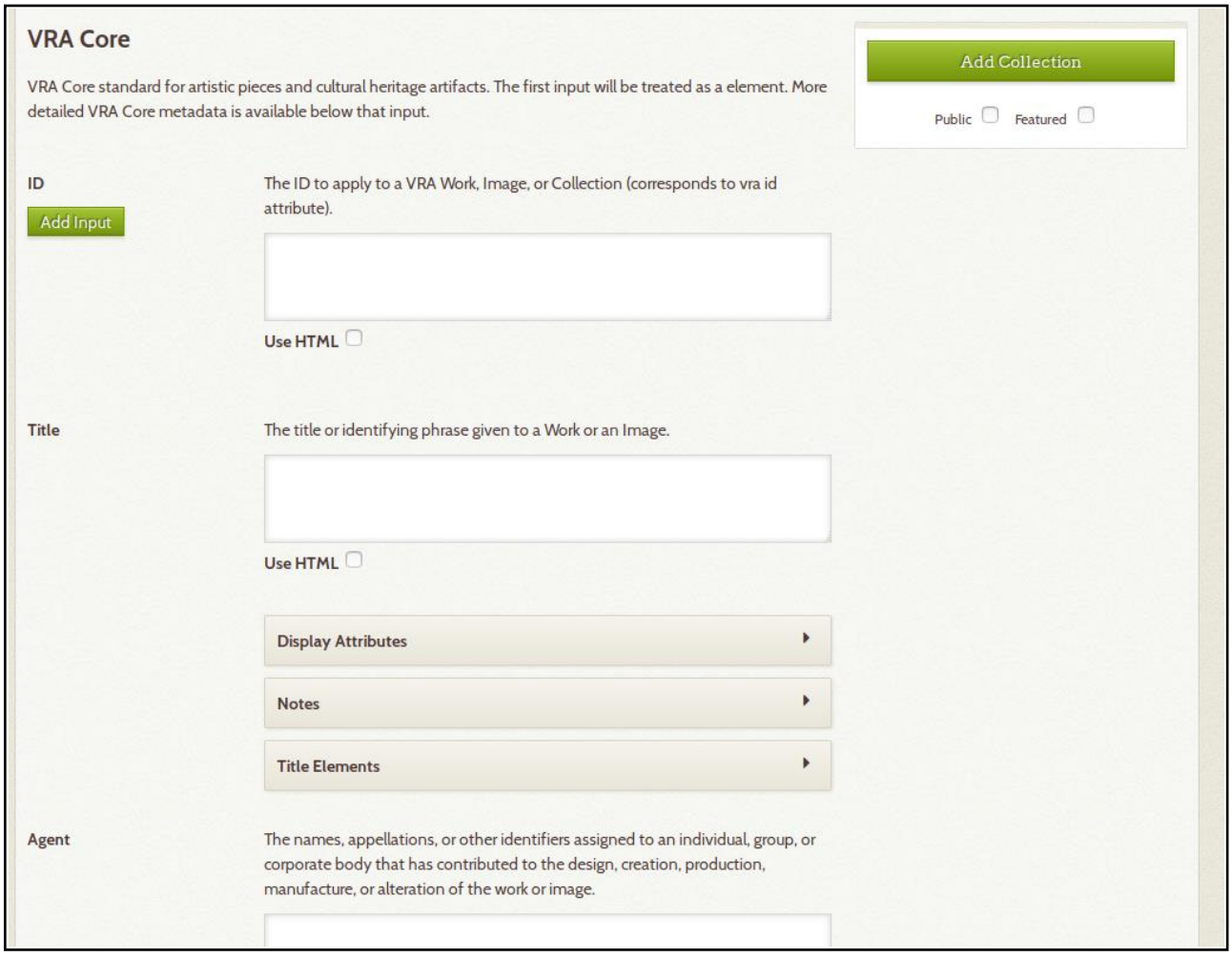


Figure – 2: Interface of VRA Core

Sequence Graph

Text analysis can be made on the basis of five components such as name, text element, sequence element, sequence type, and sequence range. For the formation of this graph a time range is first selected. For this following particular graph a time range i.e the appearnce of terms between 2000 and 2018 or simply 18 years has been counted. Therefore, this graph will represent the different terms those have been appeared within that time period can be easily understood as well as their frequency status can equally be visible and countable. Now, from the following graph it may be described that between the said time period (i.e 2000-2018), the terms like *web, semantic, lis, date,*

cloud, winisis, and library have appeared in different numerical value and hence, their the frequency status can equally be calculated and shown in the Figure – 3.

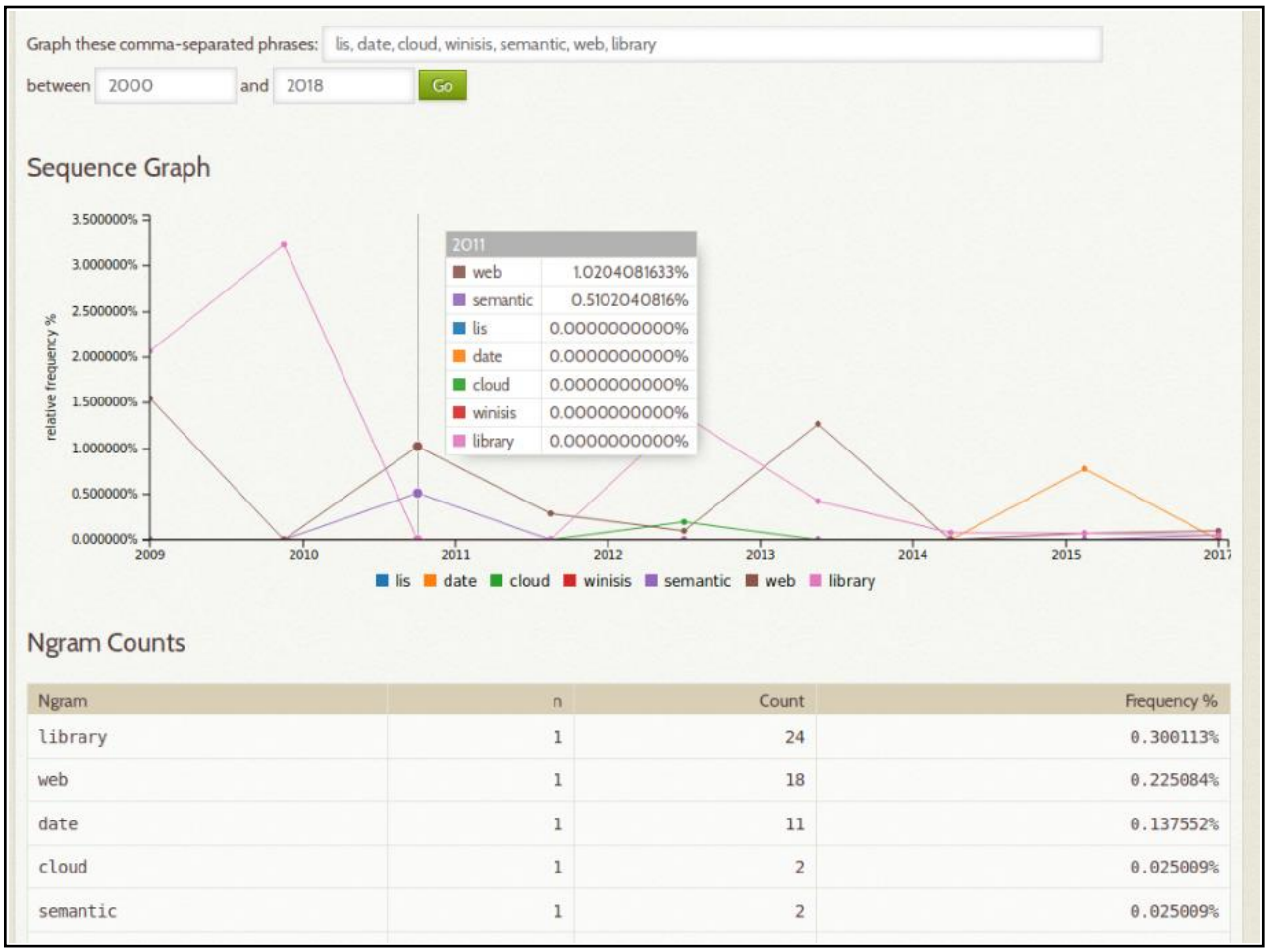


Figure – 3: Sequence Graph Interface

Conclusion

Metadata is an inevitable and indespensible to each and every library for digitization. This research paper has successfully managed the digital resources by using Omeka open source software. It is possible to manage the multiple resources through Visual Resource Association (VRA) Core. Graph visualization is also possible through the ngram view and sequence graph for display the terms frequency which available in the Omeka database. Most of the institutions are highly benefitted by using this metadata standard for the management of digital resources in different institutions such as museums, libraries, and other institutions also. This is very user-friendly for easy installation and configuration of the integrated framework.

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