LRMI Implementation: Overview, Issues and Experiences

A Cetis report for LRMI.
By Lorna M. Campbell and Phil Barker.

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Abstract

This paper presents a summary and synthesis of ten Learning Resource Metadata Initiative (LRMI) implementation projects funded by the Bill and Melinda Gates and William and Flora Hewlett Foundations between 2012 and 2013. Funding was allocated to ten OER platforms, through Creative Commons, as part of the Gates funded LRMI project. Cetis were commissioned by Creative Commons to produce cases studies on each project, and to undertake a synthesis of their experiences and outputs. This synthesis outlines the methodology undertaken, before presenting a brief introduction to each OER platform along with an overview of platform functionality, scope, and technologies deployed. All ten platforms adopted different approaches to implementing LRMI, which are examined in the context of metadata creation and curation workflows. A summary of the implementation projects' interaction with the Learning registry is also included together with the outlook for sustainable LRMI implementation.

Keywords: Learning resource metadata initiative, resource description, metadata, open educational resources, resource management, standards. LRMI, OER

Contents

1. Introduction

Since its establishment in 2011, the Learning Resource Metadata Initiative (LRMI[1]) has aimed to make it easier to publish, discover, and deliver quality educational resources on the web. From 2011 to 2014 the initiative was co-led by the Association of Educational Publishers[2] (AEP) - the 501(c)(3) division of the Association of American Publishers, and Creative Commons[3], and funded in three phases by the Bill & Melinda Gates Foundation. In October 2014 the leadership and governance of LRMI passed to the Dublin Core Metadata Initiative, a long-established metadata community with expertise in metadata design, implementation and best practice.

As part of the second phase of the project in 2012/2013, the Bill and Melinda Gates Foundation and the William and Flora Hewlett Foundation funded Creative Commons to work with ten OER platforms to implement LRMI. Subsequently, during phase three of LRMI in 2013/2014, Cetis were commissioned by Creative Commons to produce cases studies of the projects' implementations, and to undertake a synthesis of their experiences and outputs.

2. Methodology

Representatives of each project were interviewed via skype, with a standard questionnaire used to structure the interviews. The questionnaire covered platform, metadata, learning resources, LRMI technical implementation, sharing CC0 metadata with the Learning Registry[4] and sustainability. Not all parts of the questionnaire were relevant to all projects. Some projects chose to fill in their questionnaires prior to the skype interviews, in other cases the questionnaire was used to loosely structure the interview conversation. Any documentation produced by the projects, such as reports, blog posts and mappings, was also reviewed at this stage. Draft cases studies were produced based on the outputs of these interviews and shared with each project for comment and approval. Once the final draft of each case study was agreed, they were disseminated via the Open Word blog[5] and twitter, and once all ten were posted they were shared with the LRMI google group. The case studies have also been added the the LRMI Knowledge Base[6] developed by AEP.

Given the diverse nature of the projects funded, this synthesis focuses on presenting an overview of the implementations, summarising the different types of OER platforms that have implemented LRMI based on their functionality (e.g. search and discovery, authoring, aggregation, dissemination, etc.), the type of technologies used, and the sectors they cover. The synthesis explores the many different ways that the projects have used LRMI; some used LRMI as the native representation of metadata within their data stores, others used custom metadata schema internally and mapped to LRMI; some platforms import LRMI metadata created externally, others enable the creation of LRMI metadata for export and use by others. Projects' engagement with the Learning Registry is also summarised along with any future plans to continue developing LRMI implementations and engaging with the LRMI developer community.

[1] http://www.lrmi.net/
[2] http://www.aepweb.org/
[3] http://creativecommons.org/
[4] http://learningregistry.org/
[5] http://lornamcampbell.wordpress.com/tag/lrmi-implementation/
[6] http://www.lrmi.net/knowledgebase/

3. Platform Overview

Ten OER platforms and applications received funding to implement LRMI, these platforms describe their functionality as follows

OpenStax CNX

'OpenStax CNX is a dynamic non-profit digital ecosystem serving millions of users per month in the delivery of educational content to improve learning outcomes. There are tens of thousands of learning objects, called pages, that are organized into thousands of textbook-style books in a host of disciplines, all easily accessible online and downloadable to almost any device, anywhere, anytime.'

http://cnx.org/

Curriki

'Curriki provides peer reviewed open educational resources, curricula and instructional materials to support teachers, professional educators, students, lifelong learners, and parents, primarily in the domain of K-12 education. Curriki is a nonprofit organization and the majority of the resources it provides carry Creative Commons licenses.'

http://www.curriki.org

Gooru

'Gooru's mission is to honor the human right to education. We are dedicated to engaging a community of teachers, developers, and supporters to unleash personalized learning with technology to educate all the students of the world.'

http://www.goorulearning.org/

OER Commons

'ISKME's[7] OER Commons offers a comprehensive infrastructure and suite of services for educators globally, including groups of curriculum specialists, administrators, content providers, teachers, librarians, and technology and resource decision-makers who seek to implement high quality and adaptable curriculum through the use, evaluation, and improvement of open educational resources (OER).'

www.oercommons.org

Open Tapestry

'Open Tapestry is all about discovering, adapting, and sharing learning resources, whether you're a teacher, an instructor, a professor, a corporate trainer, a learner, or just a curious mind! We help you organize your content into categories–or Tapestries–that you create. Open Tapestry's toolset allows instructors to develop course materials in a fraction of the time, while invigorating and enhancing learners' experience.'

http://www.opentapestry.com/

Jorum

'Jorum is a Jisc[8] funded Service for UK Further and Higher Education, to collect and share open educational resources, allowing their reuse and repurposing. Jorum's free online repository service forms a key part of Jisc's Learning and Teaching digital content offering. It is the first port of call for thousands of resources, all shared and created by those who teach or have been inspired in the FE and HE and professional skills community.'

http://www.jorum.ac.uk/

[7] *http://www.iskme.org/ ISKME is the Institute for the Study of Knowledge Management in Education.*
[8] *http://www.jisc.ac.uk/ Jisc 'provide digital solutions for UK education and research'*

MERLOT

'MERLOT is a free and open peer reviewed collection of online teaching and learning materials and faculty-developed services contributed and used by an international education community. The MERLOT collection consists of tens of thousands of discipline-specific learning materials, learning exercises, and Content Builder web pages, together with associated comments, and personal collections, all intended to enhance the teaching and learning experience.'

http://www.merlot.org/

P2PU

'P2PU is a grassroots open education project that organizes learning outside of institutional walls and gives learners recognition for their achievements. P2PU creates a model for lifelong learning alongside traditional formal higher education. Leveraging the internet and educational materials openly available online, P2PU enables high-quality low-cost education opportunities. Learning for the people, by the people. About almost anything.'

http://info.p2pu.org/

PhET Interactive Simulations

'PhET provides fun, interactive, research-based simulations of physical phenomena for free. We believe that our research-based approach- incorporating findings from prior research and our own testing- enables students to make connections between real-life phenomena and the underlying science, deepening their understanding and appreciation of the physical world.'

http://phet.colorado.edu/

Untrikiwiki

'The purpose of this project was to allow MediaWiki-based Open Educational Resource (OER) communities to adopt LRMI. This was done in two ways. Firstly, we built the technical infrastructure necessary for MediaWiki-based OER communities to implement LRMI. Secondly, we approached MediaWiki-based OER communities in attempt to convince them to use LRMI.'

http://untrikiwiki.com/wp-content/uploads/2013/06/LRMI-Untrikiwiki-Exit-Report.pdf

3.1 Platform Functionality

The OER platforms that undertook the LRMI implementation projects encompassed a wide range of functionality which can be loosely categorised as follows: repository, discovery, harvesting, delivery, authoring, collection creation and remixing. It is important to note that almost all platforms provide multiple functionality, though some focus more on one particular function that others. Only one project, Untrikiwiki, focused exclusively on a single function, in this case authoring.

Throughout this synthesis the term 'resource description' is used to encompass both formal machine readable metadata records, and human readable text e.g. abstracts and comments.

Repository

In this context the term 'repository' is used in the general sense of being a place where things may be stored. Some projects stored learning resources (e.g. OpenStax CNX, PhET, Curriki, P2PU), some stored information about the learning resource (e.g. Merlot and OER Commons), and others stored both resources and information about resources (e.g. Jorum). In some cases, platforms allow resources and information to be aggregated in such a way as to create new learning resources, e.g. Open Tapestry enables users to create and share modules, or tapestries, aggregated from existing content. In all cases the aim of the repository is to disseminate material, none of the project platforms

are used for archival purposes or purely for internal content management. Some of the platforms host content from a wide range of users (e.g. MERLOT and Jorum) while others disseminate the outputs of specific projects (e.g OpenStax CNX and PhET).

Discovery

Unsurprisingly, the primary purpose of implementing LRMI was to assist with resource dissemination and discovery. We can distinguish between platforms that aim to facilitate the discovery of resources created by or through the project (e.g. Open Tapestry, OpenStax CNX, PhET and Curriki), and those that facilitate the discovery of resources created more widely (e.g. OER Commons, MERLOT, Jorum, Gooru). Gooru's search function which provides users with the ability to search over 16 million resources is a good example of a platform that primarily aims to facilitate resource discovery.

Harvesting

While some platforms are designed to enable the creation of original learning resources and descriptions, others (e.g. Open Tapestry, OER Commons and Gooru) harvest resource descriptions from external repositories and collections, and the web more generally. Although harvested metadata may be reviewed, edited, amended and harmonised, this initial reliance on externally produced metadata is significant in determining the information that is available for any given resource.

Authoring

In addition to harvesting and disseminating resources and resource descriptions, several platforms also enable users to create original resources, however it is useful to distinguish between the types of resources that can be created. OpenStax CNX, Untrikiwiki and PhET focus on authoring particular types of resources (eTextBooks, wikipages and simulations respectively), whereas others enable the creation of aggregated resources similar to playlists or reading lists (see Collection Creation and Remixing below).

Collection Creation and Remixing

Several of the platforms that provide repository functionality also facilitate the creation of personal or group collections (e.g. OER Commons, Merlot, Gooru). These collections can be structured or sequenced, blurring the distinction between a collection of existing resources and the creation of a new resource. Both Open Tapestry and Gooru enable users to search for resources that can then be sequenced into a playlist, together with tasks and assessments, to create what is effectively a new resource.

Delivery

The LRMI Implementation Project platforms deliver learning resources in a wide range of different ways and formats. At its simplest, delivery may simply mean the ability to download a resource from a repository. OpenStax CNX enables users to download textbooks in a range of formats; Jorum accommodates multiple resource formats but only allows the download of resources in the format they were originally uploaded in (e.g. IMS Content Packages). Other platforms offer web-based content; for example Curriki hosts resources that users create on the platform and PhET hosts and delivers JAVA simulations, Open Tapestry and Gooru allow the creation and delivery of dynamic playlists.

3.2 Scope

Many of the OER platforms focus on a specific sector of education. Open Tapestry, OpenStax CNX, Merlot, and Jorum all address higher education, colleges or universities; Gooru, and Curriki primarily

address school / K-12 levels; while PhET and OER Commons cover all levels. Most platforms generally aim to operate within the context of formal education, referring to 'teachers', 'staff', 'faculty', 'students' and 'pupils'. P2PU is distinct in that it is designed to support learning communities outwith institutions. Curriki also provides services and resources for homeschoolers.

Apart from Jorum, which is based in the UK and Curriki, which has a presence in Europe, most of the platforms are based in the US, though all aim to have some degree of international reach. PhET in particular has made a concerted effort to internationalize its resources, offering translations of its simulations in over 70 languages from Armenian to Basque, while Curriki has sites in Finnish and Japanese.

PhET is also notable in that it is the only platform that addresses a limited scope of academic subjects, originally being *Physics* Educational Technology but having branched out to other sciences.

Resources

Most of the platforms that implemented LRMI are capable of accommodating a wide range of resource types. Only two host a limited range of resource; OpenStax CNX deals with eTextBooks in EPUB and PDF formats and PhET disseminates Java simulations.

For reasons that will be discussed below, it is impossible to put a precise figure on the number of resources that have been described using LRMI across all ten platforms, however several platforms gave a rough estimate of the number of resources they hold in their collections and catalogues.

Platform	Number of Resources
Curriki	42,000
Gooru	18 million in catalogue, 180,000 tagged against CCSS
Jorum	16,000+
MERLOT	46,000
OER Commons	55,000 mapped to LRMI compliant metadata
Open Tapestry	~ 1 million
PhET	4608

3.3 Platform Technologies

There is very little commonality in the technologies used across the ten platforms and projects. Nearly all platforms are based on bespoke, custom or proprietary applications, with the exception of Jorum, which uses the DSpace repository platform, and Untrikiwiki, which is based on Mediawiki. The base technologies and applications used to create the custom platforms include JAVA (Merlot, Gooru, curriki), Django (OER Commons), Python (OpenStax CNX), Rails (Jorum, Open Tapestry) and Drupal (P2PU).

Although all the platforms aim to deliver open educational resources, not all use open source software, and even those that do, do not necessarily release their modifications. Open Tapestry and OER Commons are not (to our knowledge) open source, Jorum's modifications to DSpace are open

source, but have not yet been contributed back to the DSpace project. PhET, OpenStax CNX, Gooru, curriki, untrikiwiki, and P2PU are all open source and make their source code available through the following repositories; OpenStax CNX, Jorum, Gooru APIs, Curriki and P2PU are available through GitHub[9], Phet is available through unfuddle[10], and Untrikiwiki is available through Mediawiki[11].

4. Approaches to Implementing LRMI

The ten projects adopted a range of different approaches to implementing LRMI. In most cases this was dictated by the mechanisms for creating and managing metadata that were already supported by their current platforms.

Only one platform, P2PU, uses LRMI as its base metadata schema; although Gooru reported that they had incorporated components of LRMI into their internal metadata representation. By contrast, the other platforms use their own pre-existing schema which has been mapped to LRMI and other metadata formats. Such mappings can be used to generate LRMI metadata for export, or to add descriptive metadata to resources displayed as web pages. Other than OER Commons, few of the projects specified whether their internal metadata schema is based on existing standards. OER Commons' internal metadata profile is based on the LOM[12], with additional fields incorporated from A11Y[13].

Although all projects implemented LRMI in some form, this does not necessarily mean that all records held by the platforms contain LRMI properties. In many cases the OER platforms are dependant on metadata that is available for harvesting, or on metadata that is supplied by users at the point that they create or upload resources. Few projects actively curate their metadata. Consequently, although a project may have implemented LRMI in such a way as to make it possible to store information about LRMI properties, this information may not necessarily be available. P2PU reported that all resource creators have the option to add LRMI metadata, but there is no guarantee that this information will be provided. Similarly, Open Tapestry explained that their metadata form includes fields for all LRMI elements, but to date users have tended not to fill them in.

Some platforms generate a small amount of metadata automatically if none exists, and in the case of PhET, some LRMI properties are implicit and recorded as the default value; the learning resource type for all PhET resources is 'simulation' and interactivity type is 'active'.

Untrikiwiki is unique in that the project implemented LRMI by creating an application to enable LRMI to be embedded as microdata in HTML pages generated by Mediawiki; it implemented the means to create LRMI, rather than LRMI metadata per se, or services based on it.

4.1 Exposing LRMI

A variety of approaches have been employed in order to expose LRMI metadata to search engines. OER Commons, Curriki, PhET and Merlot all include LRMI microdata in the HTML representation of their resources. Jorum, creates a DSpace landing page for each resource which includes LRMI microdata in the HTML of the landing page.

[9] https://github.com/
[10] https://unfuddle.com/
[11] https://www.mediawiki.org/wiki/MediaWiki
[12] http://standards.ieee.org/findstds/standard/1484.12.1-2002.html
[13] http://a11yproject.com/

The projects also enabled the export of LRMI metadata in a number of formats; XML (e.g. OER Commons), HTML (e.g. OER Commons, MERLOT), OAI-PMH (e.g. Curriki, Phet, Jorum) and export to LOM as OAI-PMH (Curriki, Jorum).

4.2 Metadata Workflows and Curation

A range of different workflows are employed by the OER platforms in order to generate and manage metadata. Most rely on users to create metadata, some only allow users to edit the records they create themselves, others (Open Tapestry, Curriki) enable users to add to existing metadata records. A few platforms do not allow metadata records to be modified after they have been created. OpenStax CNX metadata can only be edited as part of the content, which must be republished if the metadata is to be updated. In addition, OpenStax CNX archives a copy of every metadata record published. Several platforms (OER Commons, P2PU, PhET and Gooru) generate a small amount of metadata automatically.

Few platforms review or actively curate metadata records before publishing them, with the exception of OER Commons, Curriki, and Gooru,

Curriki Metadata is generated by users and reviewed by volunteer subject matter experts who review resources using a four point rubric and assess the quality and alignment of the metadata.

Gooru harvests basic metadata (title, author, publisher, description, etc.) before passing it to a QA cleaning team, who manually identify more nuanced characteristics, e.g. educational use, time required, etc. For subjective fields, such as educational use, a script has been created for cleaning the metadata.

OER Commons features a number of sophisticated metadata workflows:

1. Collection providers send a CSV file to a metadata technician who reviews the data, normalises it, and uploads it in bulk.
2. Individual users upload content and metadata via a web form. All resources and metadata are reviewed before submission.
3. The OER Commons content authoring tool allows users to create metadata and computes some fields users may not be familiar with, e.g. licence.
4. Users can add free text to resources that have already been catalogued. This free text can be transformed into keywords that are used to align resources with a range of standards.

5. Sharing CC0 Metadata with the Learning Registry

As a condition of their project funding projects were required to share CC0[14] metadata with the Learning Registry, however for a variety of reasons, some technical, some strategic, there was little progress in this area.

The Learning Registry[15] is 'a new approach to capturing, connecting and sharing data about learning resources available online with the goal of making it easier for educators and students to access the rich content available in our ever-expanding digital universe'. Technically, the Learning Registry is a

[14] *CC0 is a Creative Commons Public Domain Declaration whereby the owner of a work may waive their copyright and neighboring rights to the extent allowed by law, http://creativecommons.org/publicdomain/zero/1.0/ .*

[15] *http://learningregistry.org/*

scheme free data store based on CouchDB with a defined API for accessing data. Although it is officially 'metadata schema agnostic', in practice LRMI as JSON-LD is a common choice of record format.

As OER aggregators, some platforms(e.g. Open Tapestry), primarily consume rather than produce metadata and consequently had nothing to share. Other platforms do produce metadata but do not share it under open licence as producing high quality metadata and search services to their partners and stakeholders is an integral aspect of their business models. One platform stated that they did not share metadata with the Learning Registry as this was not prioritized by their users needs analysis and there was no demand from their stakeholder community. Two platforms (Jorum and OpenStax CNX) did not attempt to share metadata with the Learning Registry as they were undergoing system redevelopments at the time. OpenStax CNX was undertaking a major system rewrite and Jorum was upgrading to DSpace 4. The Jorum development team, who have already undertaken a successful trial implementation of a Learning Registry node, do intend to share CC0 metadata with the Learning Registry in the future.

PhET did initially share CC0 metadata with the Learning Registry, however backwards-incompatible changes were made to the Registry that prevented PhET from continuing to publish metadata. The PhET team indicated that they would be able to rewrite their code to be compatible with the changes that had been made, but they have not had any requests to do so and have not received any feedback resulting from PhET data previously shared with the Learning Registry.

To conclude, although there are some technical issues that prevented platforms sharing metadata with the Learning Registry, most chose not to as a result of perceived lack of demand, or because it was incompatible with their business models and organisational strategies. While OER platforms routinely share CC licensed content and resources, it appears that few at present are willing to share CC0 metadata in a similar manner.

6. Sustainability and Outlook

Although several projects noted that they had not observed any measurable impact as a result of implementing LRMI, they also felt it had been beneficial to be involved in the LRMI Implementation Projects and to be at the 'cutting edge' of metadata technology.

Few of the projects had immediate plans to further develop their LRMI implementations but several added that they were keen to remain engaged with the LRMI community.

None of the projects reported major technical problems, and several noted that LRMI was relatively straightforward to implement. As a result of the LRMI implementation projects it appears that awareness of schema.org has also been raised, with several platforms implementing schema.org properties in addition to LRMI.

Through these projects and other implementations of LRMI,[16] there is now a reasonably substantial and growing corpus of LRMI metadata available for use by search services. This corpus comes from a variety of sources, with a range of different business models and workflows, drawing on metadata that was created to fulfill disparate requirements. In other words, it is representative of real-world use of LRMI 'in the wild'. From this metadata it is possible to illustrate some of the challenges faced those who wish to create a resource discovery service built on such metadata, and also to move from the question 'how can I expose metadata as LRMI?' to 'how best can we expose LRMI to facilitate web-wide learning resource discovery?' Initial observations based on these implementations suggest some

[16] *For some examples of commercial and organic implementation of LRMI see 'Who is using LRMI metadata' on Phil Barker's work blog, http://blogs.pjjk.net/phil/who-is-using-lrmi-metadata/*

issues around understanding technical details of the specification, for example how to use the LRMI Alignment Object. They also confirm the expectations of many involved in the creation of the LRMI specification that further work is required in the area of value spaces for some of the properties, in particular understanding which vocabulary terms and schemes are commonly used when exposing LRMI metadata. Without this agreement it remains difficult to create search services that can select or filter resources on the basis of properties such as education level or learning resource type.

7. Conclusions

LRMI has been successfully implemented in the context of a range of different platforms that support the dissemination of open educational resources. None of the projects noted any significant difficulties with implementing the specification, however none noted any immediate increase in traffic as a result of doing so. This latter observation is not surprising given that major search engines will not support LRMI until there is a substantial level of implementation across the web, in the interim it is possible that modest benefits may be seen resulting from specialist search services that exploit LRMI. A major conclusion of the study is that "implementing" LRMI may take many forms, including using it internally rather than to expose metadata to external search engines. Again this is not surprising given the variety of business models and workflows adopted by the platforms; it does show that LRMI is versatile and has potential application beyond marking up metadata embedded in HTML pages.

Appendix: Individual Case Studies

This synthesis report draws on 10 individual case studies of the implementation projects discussed. These case studies can be obtained from the Open World blog at the following URLs:

Curriki
http://lornamcampbell.wordpress.com/2014/09/02/lrmi-implementation-case-study-curriki/

Gooru
http://lornamcampbell.wordpress.com/2014/08/14/lrmi-implementation-case-study-gooru/

ISKME OER Commons
http://lornamcampbell.wordpress.com/2014/10/03/lrmi-implementation-case-study-iskme-oer-commons/

Jorum
http://lornamcampbell.wordpress.com/2014/08/07/lrmi-implementation-cases-study-jorum/

MERLOT
http://lornamcampbell.wordpress.com/2014/08/15/lrmi-implementation-case-study-merlot/

Open Stax CNX
http://lornamcampbell.wordpress.com/2014/09/23/lrmi-implementation-case-study-openstax-cnx/

Open Tapestry
http://lornamcampbell.wordpress.com/2014/08/06/lrmi-implementation-case-study-open-tapestry/

P2PU
http://lornamcampbell.wordpress.com/2014/08/29/lrmi-implementation-case-study-p2pu/

PhET Interactive Simulations
http://lornamcampbell.wordpress.com/2014/08/22/lrmi-implementation-case-study-phet-interactive-simulations/

Untrikiwki
http://lornamcampbell.wordpress.com/2014/09/04/lrmi-implementation-cases-study-untrikiwiki/

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Cetis is the **Centre for Educational Technology, Interoperability and Standards**. Our staff are globally recognised as leading experts on education technology innovation, interoperability and technology standards. For over a decade Cetis has provided impartial strategic, technical and pedagogical advice on educational technology and standards to funding bodies, standards agencies, government, institutions and commercial partners.

Cetis are active in the development and implementation of open standards and have been instrumental in developing and promoting the adoption of technology and standards for course advertising, open education resources, assessment, and student data management, opening new markets and creating opportunities for innovation. Our work includes a wide range of activities from representation at national standardisation bodies, facilitation of online and face-to-face events to production of a range of formal and informal publications.

http://www.cetis.ac.uk

About LRMI

Since its establishment in 2011, the Learning Resource Metadata Initiative (LRMI) has worked to make it easier to publish, discover, and deliver quality educational resources on the web. From spring 2011 through fall 2014 the Learning Resource Metadata Initiative was funded by the Bill & Melinda Gates Foundation, and jointly lead by Creative Commons and the Association of Educational Publishers—now the 501(c)(3) arm of the Association of American Publishers. With input from a wide range of organisations, from both the open and commercial spheres, involved in publishing and using educational resource LRMI successfully proposed additions to schema.org (an initiative of Google, Yahoo and Bing) allowing the description of educationally important properties of resources to be marked-up in web pages in a manner that is easily understood by search engines. This enables people to create search engines that support the filtering search results based on criteria such as their match to a specific part of a curriculum, or the age of the students, or one of several other characteristics.

As of October 2014 the leadership and governance of LRMI passed to the Dublin Core Metadata Initiative, a long-established metadata community with expertise in metadata design, implementation and best practice.

http://www.lrmi.net/

About Creative Commons

Creative Commons is a nonprofit organization that enables the sharing and use of creativity and knowledge through free legal tools. They are best known for their free, easy-to-use copyright licenses that provide a simple, standardized way to give the public permission to share and use a creative work subject to a choice of conditions. CC licenses let you easily change your copyright terms from the default of 'all rights reserved' to 'some rights reserved.' Creative Commons builds infrastructure. Their users build the commons itself. Creative Commons are working to increase the adoption of their tools, to support and listen to our users, and to serve as a trusted steward of interoperable commons infrastructure.

https://creativecommons.org/