

## Development of a Cross Institutional Digital Repository

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(Note: Until July 2015, Maggie was the Dean of Libraries at the University of Wyoming)



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### Abstract:

*Through the expertise of many, we can leverage success for the collaborative was the guiding philosophy as members of the Colorado Alliance of Research Libraries considered how we might utilize technology and software to join our digital collections enabling access to a wealth of collections. In 2013, members of the Alliance were struggling to develop and support digital collections in a variety of formats. Librarians were unsure how to handle video, photos, books, and learning objects that seemed to mushroom overnight with rising and uncontrolled costs. In addition, many of the members lacked technical and professional staff to develop critical digital access. Working together, Alliance members sought a common solution that would enable every member to achieve success in providing open access to existing collections and to develop new collections that were responsive to the respective organizations.*

*Through the use of information technology, members were able to develop a new system that would meet the needs of a variety of member libraries and across the Colorado Wyoming border. Members also pooled resources to hire staff to manage the digital repository in addition to forming communities that would oversee the direction and management of the site. Through institutional collaboration of multi-type institutions, the Alliance was able to improve access to rich digital collections and to expand digital services to new collections such as theater performances, learning objects, and radio shows. The Alliance members were able to transform routine digital projects at the local level into an engaging, relevant, and attractive set of resources for the Rocky Mountain region.*

*This paper will describe the process of forming a cooperative, selecting open and commercial software to develop the repository, and how social engineering is critical to the success of any cooperative.*

**Keywords:** repositories, digitization, collaboration, cooperation, technology

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## **Introduction**

Librarians are known for their ability to collaborate and there are many examples of how libraries work well together to advance shared goals. Regional associations bring together libraries for joint collection purchases, national libraries develop shared reference services, cooperative cataloging and interlibrary loan services are provided by OCLC and other service providers, and there are many examples of shared catalogs. So it is only natural that as libraries develop digital collections, librarians would explore ways to share expertise and work that benefit the joint goals of the partners. Many digital projects are subject specific or focused on thematic collection. For instance, the Wyoming State Library was a leader in developing a joint digital collection titled “Western Trails” that pulled together a variety of documents from different libraries to provide an overview on trails running through Wyoming, Colorado, Nebraska, and Kansas (<http://uwyo.coalliance.org/islandora/object/wyu%3A3324> ). The Internet Archive of Early Journals is an example of the Universities of Birmingham, Leeds, Manchester, and Oxford working together to digitize 18<sup>th</sup> and 19<sup>th</sup> century journals (<http://www.bodley.ox.ac.uk/ilej/>). These projects are typically funded through grants or special funding and may have a finite period of development. The challenge with such projects is sustainability if initial funding is not ongoing or should the leader of the project leave the library and there is no longer a champion for continuing the work. But such projects are excellent for building an appreciation for digital collections and will lay the groundwork for additional efforts in developing online resources. In addition, short term projects provide an understanding of the staffing requirements, hardware and software needs, and sustainable funding. Short term projects also provide insights into how libraries, museums, and other cultural heritage institutions can work together. Short term projects also help members understand how they might coordinate their efforts as staff understand individual strengths, institutional capacity, and effective methods of working together. Subject or themed digital projects that are well defined in terms of subject matter, scope, time period, and digital formats are great in developing expertise and relationships that may form the foundation for larger, long-term digital projects.

There are a number of challenges in developing digital collections. These include developing expertise on which platform(s) are best to manage collections and since digitization is a relatively new field, software choices are quite varied ranging from open source to site hosted to cloud solutions. Librarians are developing digital collections in addition to or complementing traditional print and commercial collections so perhaps the most significant challenge is creating new positions or redirecting existing personnel to a new endeavor. And since it is a new field within librarianship, there is not deep strength in librarianship for digital librarians so recruitment may be difficult. Digital projects require different expertise such as hardware oversight, programming, software management, preservation techniques, indexing and metadata, and the actual work of scanning images so in addition to librarian skills, libraries will require information technology, cataloging, archiving, and processing skills. The infrastructure for digital collections is complex and expensive. Hardware, software, equipment, and labor, life staffing, are new costs for libraries requiring a new source of funding and/or redirecting existing funds to support the digital initiatives. The expertise required to manage large, digital collections is another factor in drawing together institutions as they build their digital presence. With these challenges, then it is not surprising that libraries are seeking ways to share work and reduce individual costs.

## **Benefits of Joint Repositories**

There are a number of benefits in forming a joint institutional repository. Since the costs and expertise can be daunting, a cooperative digital repository may reduce individual costs for members. The costs may include software purchases, expertise to manage open source software, hardware, storage, networking, and personnel. This is not only beneficial for smaller libraries but just as valuable for larger public and academic libraries. Since digital expertise is in high demand, a joint repository may leverage the skills and knowledge of individual institutions so that the group benefits from the strengths of many.

Repositories are so complex in terms of public access, scanning techniques, varied digital files, preservation, metadata or cataloging, programming, and data storage, that it may be difficult to have the full complement of expertise within one library. By coming together – even if a joint collection is not developed – the networking is invaluable in strengthening the individual members’ knowledge and builds a cadre of experts that support each other in building digital repositories.

Similar to other successful initiatives, there is the philosophy of building a system once and use it many times by members. Joint integrated library systems are an example of developing one system that many are able to use while still maintaining individual identities. This same philosophy could be applied to a joint repository in creating a central system that many libraries could utilize for local collections. A larger repository also assist individual libraries in connecting their collections to regional or national projects such as the Digital Public Library of American (DPLA, <http://dp.la/>). It may be easier to transfer collections through a cooperative repository with advance data transfer capability than for smaller libraries. A larger cooperative project may also network with larger digital projects due to the broader expertise of the collection.

A shared repository may also provide a common or core set of functionality for individual members. For instance, one library may be expert in managing video files and another library may only have a few video files but with a common set of functionality, all members will be able to manage video files since the system provides the tools for each library. Without the group functionality, the library with only a few video files may struggle with their unique formats. The shared functionality may also lead to the members defining and agreeing to the common denominator for the project. All members will benefit from a core set of functionality realizing that there is an equal foundation for each member for their digital collections. This core set of functionality is typically built on best practices so if the members agree that metadata is an essential component, then metadata requirements will be developed or agreed to for all collections. Library patrons also benefit from common functionality. This may be critical for systems that collaborate in other areas and share the same group of patrons. For instance, joint library systems, school districts, and state or regional governments. The same look and feel combined with functionality may serve users very well in navigating digital collections. Having core functionality built on best practices will optimize the joint collections ensuring all members a quality set of digital collections.

A joint repository will achieve a greater success through joint efforts and sharing of resources and expertise. This will also position the individual members for future development of digital projects. The members will each be pulling in a common direction and as a group, can help each other develop and grow the collections as new opportunities and technologies arise. There is often a political benefit of collaboration. Individual institutions will be viewed as collaborators that share limited funding to benefit a larger group. While librarians naturally work together, this is not a value by many professions or entities who often compete on the athletic field or for limited government funding. Libraries will be highlighted for their ability to collaborate with other libraries and stretch limited funding for the common good.

### **Considerations of Joint Repositories**

There are many benefits in building a common repository for member libraries but such technology is complex and there are a number of considerations in building a common system. For digital projects, the structure may be separate systems with federated searching. This has a common look but the central project focuses on search capability while individual libraries develop and maintain their own systems. This is similar to Z39.50 searching of online catalogs – the central service develops the searching capability helping individual libraries with their data structure and indexing to maximize the federated search functionality. Individual members maintain their own software and support. A shared repository

may be more complex system in which individual libraries are on one common platform hosted by a central office or outsourced to a company or service. The platform has one primary software perhaps with a variety of additional software tools. The discovery platform is the same platform for all yet it might have some customization for each member with a slightly different look and feel to conform to local practices. This arrangement may have a large central staff or a combination of central staff with shared responsibilities at the local library. How joint repositories are arranged are as varied as the projects and no two systems are arranged in exactly the same configuration. This is the first consideration of joint projects – the complexity and variety are such that it may be difficult to outline the work and responsibilities so initial agreement as to structure will be a necessary first step.

As members outline their joint repository, each member needs to be realistic about the goals of the project. There will be an excitement that a joint project will resolve individual member needs. Or the opposite will happen in which some members will not support a joint project due to lack of confidence in the group, past failures of collaboration, or the perception that the individual library does not need to depend on others for success. Outlining specific goals that the group will agree on will help guide the development and set forth realistic expectations.

A joint repository needs to develop a set of common services or core functionality that will serve all members. Not all members may equally benefit but this will set forth a foundation of services that each member may use. The core services may also build a foundation for future development with simple functionality that builds success and leads to more advance services as the cooperative develops. This core set of functionality may also determine customization and configuration issues. Just as with integrated library systems, each library will have unique requirements or preferences so it is important for central services to define what the core set of services will include and at least initially, keep customizations to a minimum as the repository develops. This will help the group to be realistic in their individual development but it may be frustrating for instance if one library uses the term videos while another uses the term movies. This strategy will force members to adopt best practices that may be a challenge for smaller libraries who may be using volunteers to manage their collections or larger libraries who have been working on detailed metadata schemes to change to another system. The common services may be viewed as the “lowest common denominator” which has negative connotations and may cause resentment by libraries with advance digital collections. However, core functionality ensures a common set of tools for each member library and stabilizes initial costs for central services and individual members.

In developing a digital repository, it may be best to start small to build a foundation of agreement. As the system and members mature in their understanding and knowledge, then the collaborative can grow and develop. This also demonstrates success at a manageable level and it may be possible to scale projects to be more complex, larger, and more members. In considering joint repositories, the consortium needs to consider the cost of collaboration. Especially for large, complex projects, individual libraries need to weigh their contributions against individual costs. Successful consortiums realize that not every member benefits equally at all times and that individual costs may be lower but members are willing to pay more to contribute to the success of the whole. But there is a tipping point in which the contributions may be significantly more than the individual costs and one cannot justify the increased cost to the collaborative. However the project is organized and managed, this is a critical understanding of the finances and contributions of the individual members and must be considered when analyzing group benefits and individual member benefits.

## The Alliance Experience

Within the United States, there are several successful joint digital projects and many of these are listed in Appendix A. In addition, there are many large initiatives to pull together large-scale collections such as HathiTrust (<http://www.hathitrust.org/>), DPLA (<http://dp.la/>), and the Internet Archive (<https://archive.org/index.php>). So it was only natural that the Alliance would look for a cooperative solution in managing our digital collections. The Alliance, formerly the Colorado Alliance of Research Libraries, is a cooperative of academic and research libraries in Colorado and Wyoming. The Alliance has a long and strong history of cooperation that includes the CARL integrated library system and UnCover. The Alliance also facilitates cooperative collection purchases with a dedicated shared resources committee. The Prospector system, built with Innovative's INN-Reach software facilitates resource sharing among members complemented with a courier service. With such a rich history of cooperation, it was only natural that members would seek a common solution to manage their digital collections.

In 2006, the Alliance initiated a digital repository providing services for all members but within a couple of years, half the members withdrew from the project preferring different software and approaches. A smaller group of seven members agreed to focus on a new system calling it the Alliance Digital Repository (ADR). With a renewed focus, agreement on software platform, and agreed upon guidelines, the ADR started to work on a new system. The ADR formed a directors' group and a technical group with representatives from each member library. Central staffing consisted of two positions and initially, each member paid the same fees. As the ADR developed, it was clear that a different funding formula was required and the directors approved a formula based on a flat base rate, Carnegie Classification rate, and data size rate. The new formula was tiered and more realistic for the scope of the project. The ADR was built on an Islandora platform and eventually migrated to Islandora, version 7. The migration to the new version was fraught with issues including simplifying previous customizations, missed deadlines by central staff, unrealistic timelines, high expectations by member libraries, limited funding, and belief that all of the work could have been completed in-house. As the timeline for development continued to stretch out, member libraries faced concerns by their institutions that collections were not publically available and pressure on the ADR staff increased as member libraries needed to show tangible results from their investments. In late 2014, some non-ADR members indicated a willingness to look again at a broader joint repository so the Alliance formed an Institutional Repository Task Force to examine options and opportunities. The Task Force was successful in leading a broad conversation about the future of repositories and to reaffirm the commitment of all Alliance directors to collaborate as much as financially and feasibly possible on digital initiatives. But the divide between software platforms was too great to convince the entire Alliance to agree on a single platform. In May 2015, the ADR directors also determined that it was no longer feasible to maintain a central staff and member libraries lacked confidence in the ability of the central staff to successfully maintain a core set of services. The ADR will separate collections and storage for the individual members by fall 2015.

This process may be viewed as a failure to achieve stated objectives and the ADR directors are deeply disappointed in the outcome. But the directors have committed their institutions to continued collaboration and are working on a different model of collaboration. The Task Force, realizing that emerging digital solutions are disparate and distributed, recommended pursuing options to pull together member collections into a larger discovery and access system such as DPLA. It may be possible to aggregate collections in a different manner that would not be as costly for the Alliance to develop and maintain. Alliance members are also interested in high-capacity storage and continue to work with a couple of member libraries in facilitating storage of digital collections. ADR members are also committed to pulling together their technical staff to share expertise and solutions. It may be possible for members to share staffing and/or contract work as each member develops their digital collections. While the end result was not the desired outcome, the lessons, networking, and governance structure with a more

realistic understanding of costs and required work, will inform the next project. ADR members are confident that there will be another project as the promise of collaboration is too compelling to ignore.

### **Recommendations for Successful Joint Repositories**

The resulting process was not without learning more about how to work together and members are continuing to focus on ways to connect individual institutions in such a way that build the collective strength of the Alliance. There were a number of lessons learned through this experience and from the Task Force. The following recommendations may assist other libraries as they develop joint digital repositories or any type of cooperative project.

There is no perfect platform – there are many options for successful consortial systems and with the dynamic nature of technology, software and services are continually evolving. How the consortium is constituted, governed, operated, and sustained is probably far more important than the individual technology chosen. Software performance and satisfaction opinions of members may vary greatly so a tight focus on goals and functionality of a joint repository are critical as it will determine software and services.

Social engineering or group dynamics are critical to the success of any project but particularly with a complex project such as a joint digital repository. The consortium will need to have difficult conversations about how the group works together and manages joint objectives. Agreements need to be documented and reviewed in order to focus the group as the project proceeds.

A library director and digital team must be in sync regarding expectations and commitment. A director may be supportive of a group solution but not the technical person or vice versus. This disagreement may detract or derail a project. Not only must every member be in agreement but individuals within a member library must be in agreement.

Project management is essential for a successful operation. The implementation, development, and management of technology projects must be realistic and specific regarding timeframes and required work. Project management may be more critical than the technical requirements of a shared repository.

Staffing requirements must be realistic for the project work. This includes central staff as well as support work provided by individual members. There are a variety of models for staffing that vary from a large, highly controlled central staff to a small central staff that coordinates staff contributions by member libraries. Another hybrid model is outsourcing services to a cloud base service and individual members working with a vendor or contractor. Regardless of staffing models, the joint repository needs to be realistic about staffing costs and staffing contributions. This is where small, pilot projects that can scale in size and members may be beneficial as a group initiates their project.

There is a balance for size of memberships that will vary by consortium or project. It needs to have enough members to fund development and management costs but not so large that central staff are not able to provide individual member services. The finances need to be in relation to the size of the group.

Consortia constantly struggle with the tension of larger institutions being able to contribute more resources and expertise and smaller institutions being limited in their ability to support complex projects. This should not deter differing size of institutions but may determine hierarchical funding formulas or a clear expectation of goals that benefit all members but perhaps on different scales.

Size of institutions may also create tensions with larger institutions wanting more customization, configuration, and features than small institutions. Smaller institutions may be satisfied with basic

services while larger institutions require more configuration requiring more expense. Governance and project expectations are essential in outlining these differences, resolving disparate viewpoints, and developing acceptable solutions.

Successful models have basic or core functionality and services but some members fund separate enhancements and upgrades. These models allow member libraries to configure and alter some aspects of the software for a hybrid model of control and shared operations. Care must be taken that individual libraries do not customize to the extent that it compromises core services or dramatically impacts future software/system upgrades but an effective project manager finds the balance between central and specialized services with associated costs.

Outsourcing is a viable option especially for a dynamic technological environment that has high expectations for instant results. Outsourcing may be used for initial development of a joint repository, ongoing management, and/or special development or enhancements.

## Summary

Joint repositories are effective in bringing together disparate collections and services that benefit a consortium. The value proposition is raising the collective strengths of individual members to effectively and efficiently serve our patrons. It provides visibility to our library collections and advances the education and informational needs of our communities. The platform and technology are immaterial as it is the joint vision and contribution of member libraries that is most critical. This will be a difficult process as open and tough conversations are required to outline the expectations, costs, and responsibilities of central and institutional services. Even without a formal cooperative, libraries thrive when they share expertise, experiences, knowledge, and work together. It is not only a value of our profession but an effective and efficient way to serve our patrons while being wise stewards of public funds entrusted to us.

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## Appendix A

Examples of Joint Institutional Repositories in the United States, including system details where available.

Colorado Alliance of Research Libraries Digital Repository

<https://www.coalliance.org/software/digital-repository>

Florida Virtual Campus Library

[https://islandora.pubwiki.fcla.edu/wiki/index.php/Main\\_Page](https://islandora.pubwiki.fcla.edu/wiki/index.php/Main_Page)

<https://fclaweb.fcla.edu/content/digital-collections-0>

METRO (NYC Library Council)

[http://islandora.ca/sites/default/files/IslandoraCampPresentation\\_akz.pdf](http://islandora.ca/sites/default/files/IslandoraCampPresentation_akz.pdf)

<http://metro.org/collection-hosting/>

OhioLINK

<http://drc.ohiolink.edu/>

SUNYConnect

<http://www.sunyconnect.suny.edu/>

Texas Digital Library

<http://www.tdl.org/services/member-repositories/>

UCAR/NCAR

[https://library.ucar.edu/sites/default/files/content\\_files/phillips\\_DCERC\\_2014.pdf](https://library.ucar.edu/sites/default/files/content_files/phillips_DCERC_2014.pdf)

<http://opensky.library.ucar.edu/>

WRLC / ALADIN Research Commons

DSpace: <http://aladinrc.wrlc.org/>

Islandora migration: <https://prezi.com/52zuraiu7jhk/wrlc-providing-access-to-shared-information/>