Title:	**Discovery and User Interface Best Practices, University of Notre Dame, Hesburgh Libraries**

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Contents

Discovery and User Interface Best Practices
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The following set of guidelines are best practices for helping with the discovery of digital content in the repository as well as a set of examples for possible ways to display the content within the repository.

Discovery through Google, Google Scholar, and other search engines:

One of the goals of placing rare or special items in a repository is to have the collections discovered through Google, Google Scholar, and other search engines used by a broad audience. In order for this to work, certain metadata fields and content need to be in place so that the search engines can crawl the site and index the information. The following guidelines will help search engines crawl and index the repository items and aid in a higher ranking on the search returns list. The content that is hidden from view on the page is generally not crawled by the search engines so it does not aid in discovery in any way.

Robust metadata is needed in order for the content to be discovered and indexed properly by the search engines. The more information that is provided, the better the chance of the item being found and placed higher in the ranking for a Google-based search. The minimum fields that should be used for discovery are: abstract; title; author; publication date; journal or conference name including volume, issue, first page, ISSN and DOI when applicable; and subject headings or related search terms. Review the document titled Metadata Guidelines for examples of the fields and a better explanation of what to add to each field.

The information in the item's metadata record should be as complete and accurate as possible. Review the item to determine what synonyms could be used to relate the item through subject headings and related search terms. This will aid in discovery as a possible search return. The item will rank higher by having more related search terms to the user's search so a broad range of terms is best. The more robust metadata may keep the user on the site for a longer period of time and as a result aid in a potentially higher ranking as well as discovery of related materials in the repository.

The metadata at the object level is important but it is equally important to include robust metadata at the collection level, community level and higher in the repository structure. The descriptive metadata included with the collection and community levels will be captured in search results as well and aid in discovery. The text can be viewed by users in the search return brief summary. This information will aid in discovery and help draw the user in to review the materials in the collection or community. It is also good practice to include a graphic or image to make the collection introduction page more appealing.

A full-text version of the article should be made available if possible, preferably in a searchable format such as a PDF that has had optical character recognition run on it. If the article or item is handwritten or a poor quality scan then a transcription should be included so that the text can be searched. If the item is in a different language then a translation to English should be considered to aid in discovery. It is best if the item is open access so that it can be used and discovered easily.

The search engines will determine how high the content ranks in the search results by the amount of the above information provided as well as the number of times the item is linked to or cited. A large number of inbound links aid in higher search return results so it is important to cite the item or collection in multiple places that are related to the item. Use websites like Twitter, Facebook, Wikipedia, Blogs, Pintrest, tumblr, and Wordpress to post links. Look for other related collections at other institutions and see if they will place a link to your material on their site and in return your institution can place a link back to their site. With the inbound links include a brief citation of the materials so that users can quickly identify them and know what they are looking at as well as the relevancy to their query. Once the collections are loaded and being crawled consider reviewing a site like Google Analytics to determine what collections are being used most and compare how other collections could be similarly adjusted. This can also aid in determining what collections are being used the most and help with future collection development. This type of work can be performed by a team dedicated to the work or by a project manager to guarantee that none of the steps are overlooked.

Discovery through library catalog and Primo or other discovery layers:

It is good practice to keep the digital collections up to date in the library catalog. If the collection currently has a record in the catalog then the best practice is to add an e-resource link to the digital collection.

If the collection does not have a catalog record then it is best to pass the collection's link to the Cataloging Department so that they can populate a record with an e-resource link to the digital content. In these circumstances it is easiest to create a collection level record for the catalog rather than creating individual records per digital item in the collection. The collection level record can give enough information to point the user to the overall collection by highlighting the content and not overwhelm the user by having a high number of returns for individual items.

If the collection is going to be added to a discovery layer, a mapping document may be required to transfer the metadata from the repository to the discovery layer. This work will be done collaboratively with the Cataloging Department.

 A set of standardized steps for the workflow should be created so that nothing is overlooked and the items are added to all possible points of access. A dedicated team or the project manager could be in charge of making sure that each step is completed.

Discovery through marketing and print materials:

Online content can also be discovered through marketing both electronically and through print materials. As digital content is created someone should be dedicated to sending out email announcements to select lists of people or listservs. Remember to add information about the collection to sites such as Facebook or Wikipedia to help showcase the collection. Another possibility is to add a showcase to the home page of the library's website with the collection of the day, paper of the day, or new collection added. A showcase can also be added for success stories about contributors to the repository and how they were asked to speak at events or had other opportunities develop based on discovery of items they had placed in the repository.

Pamphlets highlighting what the repository has to offer can be created and passed out at various events. A portion of the pamphlet could be dedicated to showing the download counts for collections or quotes from various orders or item requests that are stored in the repository. The library can partner with other campus groups to hold a tech fest or block party type event that showcases new products and tools available for faculty and students to use. During these events, pamphlets can be handed out to interested parties to help promote growth and use of the repository. The pamphlets can be included in conference packets or new faculty hire packets to help showcase what the library has to offer for digital scholarship. A QR code can be added to exhibition posters or other advertisements for supplemental digital content.

A section could be added to the website for conferences that are held at the University informing participants about the repository. In the future, it could be required for conference presenters to preserve their entire presentation in the repository. All of the conference materials such as posters could be preserved in the repository as well. The same can be done for guest lecturers or speakers.

This work could be performed by a dedicated team or the project manager to make sure that all possible points of discovery are used. A rights statement should be included with marketing materials so that viewers know who owns the materials. It is also important to secure the rights to add links if necessary.

Collections and Online Exhibitions:

The metadata for collections and online exhibitions will be different. Online collections are generally an entire collection or a sizeable portion of the collection. An online exhibition is usually a showcase of a collection where the highlights of the collection are displayed with curatorial descriptions.

Collection level metadata is where the extra information about the collection can be added to describe to the user exactly what the collection is about and how to use the collection. The collection level metadata can give added information about the people and events portrayed in the collection that will not be brought up in the individual items. For example the collection level description can talk a overall career of the individual but the items that are shown in the collection will talk about specific tasks or jobs that they were involved with.

Items in the collection will be described in great detail about the specific item that is being displayed. The items will be described similar to a database where the user can find the item and learn about the exact facts about that specific item. The item's descriptive metadata is based off of what is truly occurring in the image or what the object is about. No extra facts or bits of information are added to the descriptions of items in a collection. This is meant to have the user discover the item and use it as a primary source to add to their own scholarly work. The item level metadata should not draw assumptions and tends to leave out other aspects of the history of the item but rather tells the immediate story at hand.

Online exhibitions display a sampling of a bigger collection or collections. As a result the descriptive metadata for these exhibitions are generally much broader and tend to include more details about the collection or event at hand, not just describing the specific item. The online exhibition will use examples from the collection but attempt to tell the highlights of the entire collection and leave out specific details that are not far reaching across the collection unless they are pertinent to the exhibition.

A quality control check can be performed on past online exhibitions to see if there are other points of discovery that can be added if the exhibitions are still active.

Structure of Repository:

As the repository grows and more collections are developed, the structure of the repository will need to be determined so that it is the most useful for users and has the best opportunity for discovery.

The different levels of the repository should be considered for branding to match logos or banners similar to the site that the collection is coming from. For example if an item comes from the Department of History the repository section for the Department of History could be designed to match the specific departmental website. This could be as simple as adding a dedicated logo to the collection so that users will know at a glance which department it belongs to. It is also best to link from the collection back to the department or group if possible from the collections. This will allow the user to learn more about the department if they wish too.

The repository should be organized in such a way that the user can easily navigate the pages and find related items quickly. The repository can be set up so that items at the community level are the highest tier in the umbrella under the repository name. The community level can be Colleges and Schools, University Libraries, Local and Regional Organizations, University Outreach, etc. The next level would be sub-communities that would fall under the community. The sub-communities that would fall under the Colleges and Schools community would be the School of Nursing, School of Medicine and College of Engineering. Each sub-community would have a branch of sub-communities and collections of their own. The School of Medicine would have the Department of Anatomy under it as a sub-community. Under the Department of Anatomy there can be another sub-community for Faculty Papers and a collection for the departmental newsletter. Under the collection level the individual items would be stored and exhibited. The structure would look like this:

Repository:
-Community
--Subcommunity
--Subcommunity
--Collection
--Item
--Subcommunity
--Collection
--Item

There are many options for the structure of the repository including the two examples listed below. The layout of the repository should be considered for not only users from the institution but also for users that discover the site through other means. As the collections grow the need for cross-repository mapping should be considered so that related items can appear in more than one collection. For example a poster from a student in the nursing program might also fit nicely in

other medical related collections. The item should appear in the various collections so that it has a higher chance of discovery and use with related materials.

The structure of the repository can be mapped out like the institution itself and show the colleges and schools through the departments and individuals involved with each department. Another possibility is to structure the repository so that similar items are stored together. These items can still be mapped to related collections but their main environment will be housed with similar items. An example for this is that all newsletters would be housed together instead of only within the department's collection.

The mapping will look like this for a structure similar to the institutions:

Repository:
    -Colleges and Schools
        --College of Liberal Arts
            --Department of History
                --Newsletters
                    History Newsletter
                --Faculty Papers and Presentation
                    --John Doe Faculty Member
                        Article 1
                        Article 2
                        Poster

The mapping will look like this for a structure similar to the related items being stored together:

Repository:
    -Newsletters, Newspapers, and Yearbooks
        --Newsletters
            --Department of History Newsletter
                Newsletter 1
            --College of Engineering Newsletter

Structure of Records:

Once the user navigates to the collection level they will be able to see the various items that are a part of that collection. The collection level view can show a thumbnail of the image and basic metadata such as the title, creator, and date. This will allow the user to quickly review the materials and pinpoint exactly what they want while browsing the collection.

If the item is clicked on at the collection level it will result in opening the item at the basic descriptive view and the ability to download the item or view/use the item. The basic metadata elements visible in this view should be the title, description, creator, date created, source information, and the recommended citation. The item itself will be downloadable from this view or used if it is a video, audio, or image.

The full item record view will show all of the metadata fields that have been filled out for the item.

There are several points to be considered about the records and how they are structured for the creation of the metadata. If the record is describing multiple items that are directly related, the description should state how many additional views are attached to the record and a description of the various views. It is important to know how many items can be attached to one record so that the metadata can reflect this information and so that you will know how many records need to be created. An example of this situation would be multiple photographs of the outside of a building. Another consideration for the records are large text files. If there is a limit to the number of words that can be searched or the file size for opening in the user interface compared to being downloaded the item may need to be separated into multiple files for ease of use. If the text file needs to be separated into multiple files then the decision has to be made to include the multiple files in one record, as long as they can be opened in the user interface and be searched, or create a single record for each file. If the images have a zooming function attached to the viewer then it is important to include details about the image that can be seen with zooming.

Glossary

Access
To interact with a system entity in order to manipulate, use, gain knowledge of, and/or obtain a representation of some or all of a system entity's resources. [RFC 2828]

Access control
Protection of resources against unauthorized access; a process by which use of resources is regulated according to a security policy and is permitted by only authorized system entities according to that policy. [RFC 2828]

Access control information
1. Any information used for access control purposes, including contextual information. [X.812]

2. Contextual information might include source IP address, encryption strength, the type of operation being requested, time of day, etc. Portions of access control information may be specific to the request itself, some may be associated with the connection via which the request is transmitted, and others (for example, time of day) may be "environmental". [RFC 2829]

Access rights
A description of the type of authorized interactions a subject can have with a resource. Examples include read, write, execute, add, modify, and delete. [WSIA Glossary]

Actor
1. A person or organization that may be the owner of agents that either seek to use Web services or provide Web services.

2. A physical or conceptual entity that can perform actions. Examples: people; companies; machines; running software. An actor can take on (or implement) one or more roles. An actor at one level of abstraction may be viewed as a role at a lower level of abstraction.

Agent
An agent is a program acting on behalf of a person or organization. (This definition is a specialization of the definition in [Web Arch]. It corresponds to the notion of software agent in [Web Arch].)

Anonymity
The quality or state of being anonymous, which is the condition of having a name or identity that is unknown or concealed. [RFC 2828]

Architecture
1. The software architecture of a program or computing system is the structure or structures of the system. This structure includes software components, the externally visible properties of those components, the relationships among them and the constraints on their use. (based on the definition of architecture in [Soft Arch Pract])

2. A software architecture is an abstraction of the run-time elements of a software system during some phase of its operation. A system may be composed of many levels of abstraction and many phases of operation, each with its own software architecture. [Fielding]

Artifact
A piece of digital information. An artifact may be any size, and may be composed of other artifacts. Examples of artifacts: a message; a URI; an XML document; a PNG image; a bit stream.

Asynchronous
An interaction is said to be asynchronous when the associated messages are chronologically and procedurally decoupled. For example, in a request-response interaction, the client agent can process the response at some indeterminate point in the future when its existence is discovered. Mechanisms to do this include polling, notification by receipt of another message, etc.

Attribute
A distinct characteristic of an object. An object's attributes are said to describe the object. Objects' attributes are often specified in terms of their physical traits, such as size, shape, weight, and color, etc., for real-world objects. Objects in cyberspace might have attributes describing size, type of encoding, network address, etc. [WSIA Glossary]

Audit guard
An audit guard is a mechanism used on behalf of an owner that monitors actions and agents to verify the satisfaction of obligations.

Authentication
Authentication is the process of verifying that a potential partner in a conversation is capable of representing a person or organization.

Authorization
The process of determining, by evaluating applicable access control information, whether a subject is allowed to have the specified types of access to a particular resource. Usually, authorization is in the context of authentication. Once a subject is authenticated, it may be authorized to perform different types of access. [STG]

Bandwidth
A measure for the speed (amount of data) you can send through an Internet connection. The more bandwidth, the faster the connection.

Binary Data
Data in machine readable form.

Bit (Binary Digit)
The smallest unit of data stored in a computer. A bit can have the value of 0 or 1. A computer uses 8 bits to store one text character.

Blog (Web Log)
A type of website (most often maintained by an individual) with a log of comments (most often personal) comments, meanings, descriptions of events, etc.

Bookmark
In web terms: A link to a particular web site, stored (bookmarked) by a web user for future use and easy access.

Bounce Rate
The percentage of web site visitors who view only one web page before they leave (bounce out).

Browse
Term to describe a user's movement across the web, moving from page to page via hyperlinks, using a web browser. (See Web Browser).

Collection
A number of documents assembled in a single physical or virtual location by one or more persons, or by a corporate entity, and arranged in some kind of systematic order to facilitate retrieval.

Collection Curator
An individual responsible for managing all aspects of a collection within the Repository. Each collection may have one or more curators who will help define specific procedures and guidelines. The curator will be a faculty or staff member from a department, research unit, and/or library. The Collection Curator is optional. The Collection Curator is one of three management roles within the Repository:
    Repository Administrator – Overall management of the Repository
    Community Administrator – Management of a community within the
    Repository
    Collection Curator – Management of a collection within a community

Community/Collection
The Mines Digital Repository uses Fez/Fedora which supports a simple hierarchy structure of communities and collections. Communities hold a collection or collections, and the collection holds digital works.

Community Administrator
An individual responsible for managing all aspects of a community, including the collections within the community. Each community will have one or more administrator who will help define specific procedures and guidelines. The community administrator will be a faculty or staff member from a department, research unit, and/or library.
The Community Administrator is one of three management roles within the Repository:
>   Repository Administrator – Overall management of the Repository
>   Community Administrator – Management of a community within the Repository
>   Collection Curator – Management of a collection within a community

Copyright Violation
Unauthorized use of material that is covered by copyright law, in a manner that violates one of the copyright owner's exclusive rights, such as the right to reproduce or perform the copyrighted work, or to make derivative works.

Deposit
Represents a bundle of submitted information. Typically, a deposit consists of descriptive metadata, access conditions and copyright information, and any relevant uploaded files. This entire set of saved information is the deposit record.

Depositor
The creator of a deposit record, who submits digital items and associated data for review, approval and upload to the repository.

Derivative File: For the purposes of the Digital Repository, a derivative file is a version of the original file in a file format considered to be more stable than the original file format. For example, if a work is submitted as a Word document we may create a derivative in a plain text or PDF format.

Discovery
The act of locating a machine-processable description of a Web service-related resource that may have been previously unknown and that meets certain functional criteria. It involves matching a set of functional and other criteria with a set of resource descriptions. The goal is to find an appropriate Web service-related resource.

Discovery service
A discovery service is a service that enables agents to retrieve Web services-related resource description.

Domain
A domain is an identified set of agents and/or resources that is subject to the constraints of one of more policies.

Domain Name
The name that identifies a web site. (like: W3Schools.com)

Download
To transfer a file from a remote computer to a local computer. In web terms: to transfer a file from a web server to a web client. (see also Upload).

DTD (Document Type Definition)
A set of rules (a language) for defining the legal building blocks of a web document like HTML or XML.

Hits
The number of times a web object (page or picture) has been viewed or downloaded. (See also Page Hits).

Home Page
The top-level (main) page of a web site. The default page displayed when you visit a web site.

HTML (Hypertext Markup Language)
HTML is the language of the web. HTML is a set of tags that are used to define the content, layout and the formatting of the web document. Web browsers use the HTML tags to define how to display the text.

HTML Document
A document written in HTML.

HTML DOM (HTML Document Object Model)
A programming interface for HTML documents.

HTML Editor
A software program for editing HTML pages. With an HTML editor you can add elements like lists, tables, layout, font size, and colors to a HTML document like using a word processor. An HTML editor will display the page being edited exactly the same way it will be displayed on the web (See WYSIWYG).

HTML Tags
Code to identify the different parts of a document so that a web browser will know how to display it.

HTTP (Hyper Text Transfer Protocol)
The standard set of rules for sending text files across the Internet. It requires an HTTP client program at one end, and an HTTP server program at the other end.

HTTP Client
A computer program that requests a service from a web server.

HTTP Server
A computer program providing services from a web server.

HTTPS (Hyper Text Transfer Protocol Secure)
Same as HTTP but provides secure Internet communication using SSL. (see also SSL)

Hyperlink
A pointer to another document. Most often a pointer to another web page. A hyperlink is a synonym for a hotlink or a link, and sometimes called a hypertext connection to another document or web page.

Hypermedia
An extension to hypertext to include graphics and audio.

Hypertext
Hypertext is text that is cross-linked to other documents in such a way that the reader can read related documents by clicking on a highlighted word or symbol. (see also hyperlink)

Identifier
An identifier is an unambiguous name for a resource.

Institutional Repository
"A university-based institutional repository is a set of services that a university offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members. It is most essentially an organizational commitment to the stewardship of these digital materials, including long-term preservation where appropriate, as well as organization and access or distribution." (Clifford Lynch)

Intranet
A private (closed) Internet, running inside a LAN (Local Area Network).

IP Address (Internet Protocol Address)
A unique number identifying every computer on the Internet (like 197.123.22.240)

Keyword
In web terms: A word used by a search engine to search for relevant web information.
In database terms: A word (or index) used to identify a database record.

OAI-PMH: Open Archives Initiative-Protocol for Metadata Harvesting (OAI-PMH) is a harvesting protocol for sharing data between online services such as repositories. Additional information about OAI-PMH can be found at http://www.openarchives.org/pmh.

Open Archival Information System (OAIS): An international standard (ISO 14721:2003) that describes the components and processes necessary for a digital archive.

OAIster: Using OAI-PMH, OAIster harvests descriptive data from repositories, digital libraries, and online journals to create a searchable catalog of digital resources. Additional information about OAIster can be found at http://www.oaister.org.

Obligation
An obligation is a kind of policy that prescribes actions and/or states of an agent and/or resource.

Open Access: "By 'open access' to this literature, we mean it's free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. The only constraint on reproduction and distribution, and the only role for copyright in this domain, should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited." Budapest Open Access Initialtive.

OS (Operating System)
The software that manages the basic operating of a computer.

Page Hits
The number of times a web page has been visited by a user.

PDF (Portable Document Format)
A document file format developed by Adobe. Most often used for text documents.

Permission
A permission is a kind of policy that prescribes the allowed actions and states of an agent and/or resource.

Permission guard
A permission guard is a mechanism deployed on behalf of an owner to enforce permission policies.

Platform
In web terms: The computer's operating system like Windows, Linux, or OS X.

Plug-In
An application built into another application. In web terms: A program built in (or added) to a web browser to handle a special type of data like e-mail, sound, or movie files.

Proxy Server
An Internet server dedicated to improve Internet performance.

RDF (Resource Description Framework)
A framework for constructing languages for describing web resources.

Redirect
In web terms: The action when a web page automatically forwards (redirects) the user to another web page.

Script
A collection of statements written in a Scripting Language.

Scripting Language
In web terms: A simple programming language that can be executed by a web browser or a web server. See JavaScript and VBScript.

Scripting
Writing a script.

Search Engine
Computer program used to search and catalog (index) the millions of pages of available information on the web. Common search engines are Google and AltaVista.

Semantic Web
A web of data with a meaning in the sense that computer programs can know enough about the data to process it.

SGML (Standard Generalized Markup Language)
An international standard for markup languages. The basis for HTML and XML.

Streaming
A method of sending audio and video files over the Internet in such a way that the user can view the file while it is being transferred.

Streaming Format
The format used for files being streamed over the Internet. (See Windows Media, Real Video and QuickTime).

Upload
To transfer a file from a local computer to a remote computer. In web terms: to transfer a file from a web client to a web server. (see also Download).

URI (Uniform Resource Identifier)
Term used to identify resources on the internet. URL is one type of an URI.

URL (Uniform Resource Locator)
A web address. The standard way to address web documents (pages) on the Internet (like: http://www.w3schools.com/)

Visit
In web terms: A visit to a web site. Commonly used to describe the activity for one visitor of a web site.

Visitor
In web terms: A visitor of a web site. Commonly used to describe a person visiting (viewing) a web site.

VPN (Virtual Private Network)
A private network between two remote sites, over a secure encrypted virtual Internet connection (a tunnel).

Web Address
The same as an URL or URI. See URL.

Web Applet
A program that can be downloaded over the web and run on the user's computer. Most often written in Java.

Web Client
A software program used to access web pages. Sometimes the same as a Web Browser, but often used as a broader term.

Web Browser
A software program used to display web pages.

Web Document
A document formatted for distribution over the web. Most often a web document is formatted in a markup language like HTML or XML.

Web Host
A web server that "hosts" web services like providing web site space to companies or individuals.

Web Hosting
The action of providing web host services.

Web Page
A document (normally an HTML file) designed to be distributed over the Web.

Web Robot
See Web Spider.

Web Server
A server is a computer that delivers services or information to other computers. In web terms: A server that delivers web content to web browsers.

Web Server Error
A message from a web server indicating an error. The most common web server error is "404 File Not Found".

Web Services
Software components and applications running on web servers. The server provides these services to other computers, browsers or individuals, using standard communication protocols.

Web Site
A collection of related web pages belonging to a company or an individual.

Web Spider
A computer program that searches the Internet for web pages. Common web spiders are the one used by search engines like Google to index the web. Web spiders are also called web robots or wanderers.

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