

# **Best practices for assessing reuse of digital content: Educational and instructional design perspectives**

Joyce Chapman  
Duke University, USA

Nicole Hennig  
University of Arizona, USA

Derrick Jefferson  
American University, USA

Ranti Junus  
Michigan State University, USA

Elizabeth Kelly  
Louisiana Library Network, USA

Ali Shiri  
University of Alberta, Canada

Ayla Stein Kenfield  
University of Illinois at Urbana-Champaign, USA

Santi Thompson  
University of Houston, USA

Liz Woolcott  
Utah State University, USA

## **I. Introduction**

As cultural heritage organizations increase access to their collections by publishing them online, digital library practitioners are increasingly tasked with assessing the value of their digitized and born-digital cultural heritage objects. Quantitative access statistics, such as downloads and clicks, show part of the story of such materials' significance to users. But data showing how these materials are used and repurposed beyond downloads may be of greater value to digital library practitioners in building user-centric digital collections that are responsive to user needs and demonstrably valuable to stakeholders. The differences between access and repurposing of digital library objects can also be framed as a distinction between the consumption of a digital library object for its initially envisaged purpose and its recontextualization and repurposing, or their "use" versus their "reuse" (Kenfield et al. 2022). While digital library practitioners often measure "use" of digital collections, they rarely measure or

assess “reuse” in research, social media, instruction, and other formats. Reuse metrics are often anecdotal and ephemeral, which makes it challenging to collect and compare them to other metrics. To that end, in 2019, the Content Reuse working group of the Digital Library Federation (DLF) Assessment Interest Group (AIG) was awarded an Institute of Museum and Library Services (IMLS) National Leadership Grant for Libraries to build the Digital Content Reuse Assessment Framework Toolkit (D-CRAFT). D-CRAFT has worked since 2019 to develop guidelines and best practices for practitioners to assess how users engage with, reuse, and transform digital content. D-CRAFT is a multi-year grant and builds on the previous DLF AIG project, “Developing a Framework for Measuring Reuse of Digital Objects” to facilitate the assessment of digital repository content beyond traditional metrics such as clicks, views or downloads.

## **II. Use versus Reuse**

Prior to the D-CRAFT project, the DLF AIG was awarded an IMLS grant for Developing a Framework for Measuring Reuse of Digital Objects (LG-73-17-0002-17). This grant conducted a formal needs assessment to determine desired functionality for a future reuse assessment toolkit and explored the concepts of use and reuse (Kelly et al., 2018). The Measuring Reuse project conducted six focus groups with digital library practitioners from across the Galleries, Libraries, Archives, Museums, and Repositories (GLAMR) landscape. Participants discussed the project Team’s definitions and examples for use and reuse alongside their own institution’s efforts to gather data in those categories. The project Team derived the following definition for use: “discovering and browsing objects in a digital library, often described as ‘clicks’ or ‘downloads,’ without knowing the specific context for this use” (Kelly et al., 2018). The Team also developed a definition of reuse based on focus group discussions, which is as follows: “how often and in what ways digital library materials are utilized and repurposed. In this definition, we do know the context of the use” (Kelly et al., 2018). In short, “use” is the initial access of an item, and nothing is known about how that item is used after it is initially accessed. “Reuse” is how the item is used after the initial access (Kelly et al., 2018). Figure II-1 shows a detailed matrix explaining the spectrum of use and reuse of digital content. Please note that this is in draft form and is currently under review as part of a manuscript submitted to the Journal of the Association for Information Science and Technology.

**Figure II-1. Use and Reuse spectrum of engagement, D-CRAFT**

Use, Reuse		Use	Reuse
		<p><i>Passive interaction with a digital object that indicates <b>potential interest and/or value</b> to an external user</i></p>	<p><i>Active interaction with a digital object(s) that demonstrates <b>an interest or value</b> to an external user</i></p>
Simple Engagement	<p><b>Access</b></p> <p><i>To come into contact with a digital object</i></p>	<ul style="list-style-type: none"> <li>• Browsing digital repositories for content</li> <li>• Clicking a link for a digital object</li> <li>• Downloading digital objects</li> <li>• Accessing a web archive</li> </ul>	
	<p><b>Consumption</b></p> <p><i>To view, read, listen, or expose oneself to the intellectual content of a digital object</i></p>	<ul style="list-style-type: none"> <li>• Watching a video online</li> <li>• Reading an article</li> <li>• Viewing a photograph</li> <li>• Listening to a song</li> </ul>	
Spectrum of Engagement	<p><b>Reformatting</b></p> <p><i>To change the medium or delivery of a digital object without changing the content itself</i></p>	<ul style="list-style-type: none"> <li>• Printing digital objects</li> <li>• Scanning a document</li> </ul>	
	<p><b>Sharing</b></p> <p><i>To expose others to the intellectual content of a digital object by distributing a means of display or access, such as a link or doi</i></p>	<ul style="list-style-type: none"> <li>• Displaying digital collection materials on social media or email</li> <li>• Citing a digital object in a scholarly article without adding interpretation</li> <li>• Citing a digital object in a Wikipedia article without adding interpretation</li> <li>• Publishing/reposting content in online or print publication without adding interpretation</li> </ul>	

Use, Reuse	<b>Use</b>  <i>Passive interaction with a digital object that indicates <b>potential interest and/or value</b> to an external user</i>	<b>Reuse</b>  <i>Active interaction with a digital object(s) that demonstrates <b>an interest or value</b> to an external user</i>
		<ul style="list-style-type: none"> <li>• Incorporating digital images into documentaries or movies without adding interpretation</li> </ul>
	<b>Reproducibility</b>  <i>To draw upon a digital object or dataset to validate or verify a previous study's methods and/or results</i>	<ul style="list-style-type: none"> <li>• Confirming a journal article's results by using an existing data set to reproduce its methods and conclusions</li> <li>• Verifying a research study's methodology by replicating its process using a different dataset</li> </ul>
<i>Complex Engagement</i>	<b>Enhancement</b>  <i>To add functionality or accessibility to a digital object</i>	<ul style="list-style-type: none"> <li>• Annotating an image or document</li> <li>• Translating the text of a digital object from one language to another</li> <li>• Transcribing a digital object</li> <li>• Creating closed captioning for a video</li> <li>• Adjusting lighting or coloring of digital items in order to faithfully represent the original object</li> <li>• Charting a dataset in a graph or infographic to communicate with others</li> </ul>

Use, Reuse	<b>Use</b>  <i>Passive interaction with a digital object that indicates <b>potential interest and/or value</b> to an external user</i>	<b>Reuse</b>  <i>Active interaction with a digital object(s) that demonstrates <b>an interest or value</b> to an external user</i>	
			<ul style="list-style-type: none"> <li>Recording a book to make an audio book</li> </ul>
	<b>Recontextualization</b>  <i>To alter the surroundings or space that affect the meaning, purpose, or intent of a digital object</i>	<ul style="list-style-type: none"> <li>Aggregating metadata in a discovery tool</li> </ul>	<ul style="list-style-type: none"> <li>Curating sets of digital material, such as People of Color in Medieval European Art History <a href="https://medievalpoc.tumblr.com/">https://medievalpoc.tumblr.com/</a></li> <li>Curriculum planning K-12 education, e.g., DocTeachs, LOC Teaching with Primary Sources, etc.</li> <li>Creating a Pinterest board of digital objects</li> <li>Citing a digital object in a scholarly article and adding interpretation</li> <li>Citing a digital object in a Wikipedia article and adding interpretation</li> <li>Publishing/reposting content in online or print publication that adds interpretation</li> <li>Incorporating digital images into documentaries or movies while adding interpretation</li> </ul>

Use, Reuse	<p><b>Use</b></p> <p><i>Passive interaction with a digital object that indicates <b>potential interest and/or value</b> to an external user</i></p>	<p><b>Reuse</b></p> <p><i>Active interaction with a digital object(s) that demonstrates <b>an interest or value</b> to an external user</i></p>
	<p><b>Transformation</b></p> <p><i>To change or alter a digital object substantially, resulting in a new, distinct entity, including, but not limited to recreations, versions, and mashups</i></p>	<ul style="list-style-type: none"> <li>• Creating “then and now” photographs for an exhibit, <a href="https://publicdomain.nypl.org/fifth-avenue/">https://publicdomain.nypl.org/fifth-avenue/</a></li> <li>• Painting, drawing, or otherwise artistically representing a digital object</li> <li>• Combining two or more datasets for analysis</li> <li>• Creating a GIF or meme from digital objects</li> <li>• Revising an existing OER object with new content</li> <li>• Overlaying a map with data points</li> <li>• Adding color to a black and white photo or video in order to add artistic value to the original object</li> <li>• Combining datasets from multiple sources and disciplines to produce a new result, intellectual framework, or model</li> </ul>

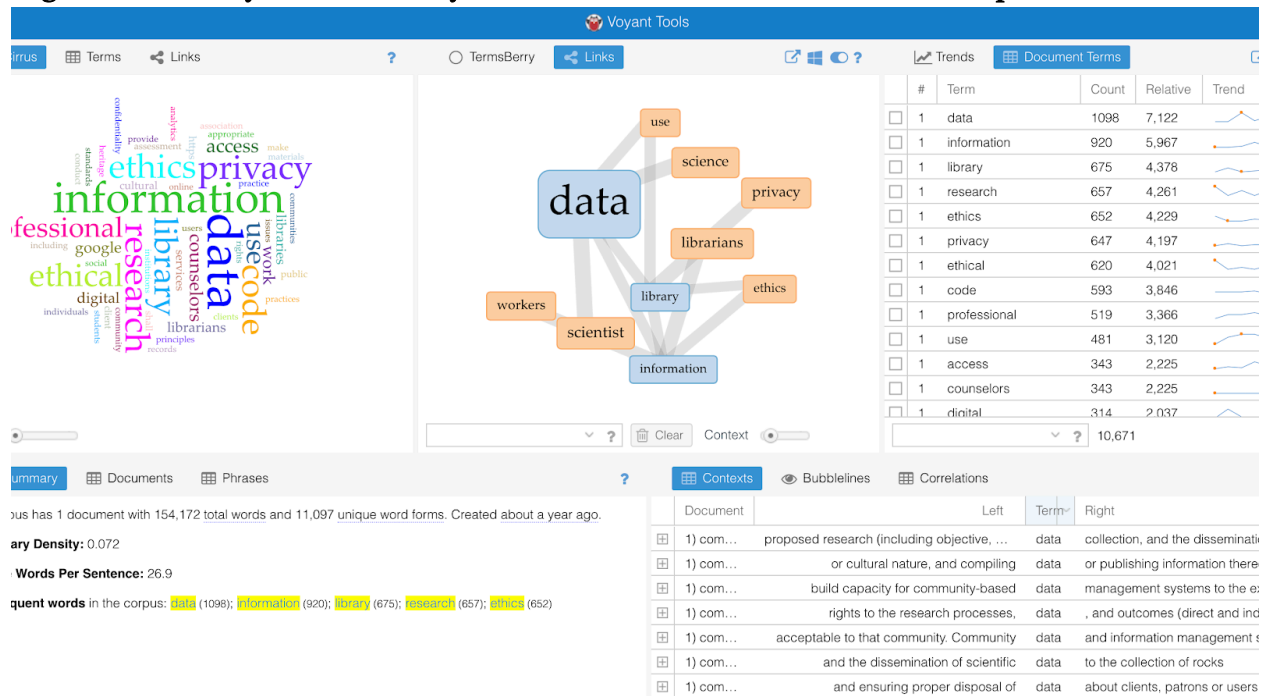
### **III. Developing Ethical Guidelines:**

One crucial component of the D-CRAFT grant is the development of the Ethical Considerations and Guidelines for the Assessment of Use and Reuse of Digital Content (hereafter, “the Guidelines”). The goal of the Guidelines is to put forth a set of principles to guide ethical assessment of use and reuse of digital content. The Guidelines focus on ethically assessing use and reuse, which is distinct from how digital content should be ethically used and reused. To that end, the Guidelines do not meaningfully consider ethical considerations beyond assessment. To accomplish the task of drafting the Guidelines, we began by identifying a void in the field’s understanding and consensus of guidelines that offer recommendations and practical examples of ethical assessment of reuse data in a GLAMR environment. The Team reviewed professional GLAMR codes of ethics, practices, and guidelines; consulted privacy and ethics working groups focused on GLAMR institutions; and leveraged the consultant expertise in areas of privacy and Diversity, Equity, and Inclusion.

To perform an environmental scan of GLAMR institutional policies and codes of practice, the Team collected 44 documents in Zotero, a citation management system. The Team split into two groups each with assigned documents. The Team also developed a set of criteria to engage with these broad documents. The criteria were based on a list of questions that each group answered for every document. Every document surveyed by the Team had multiple readers to ensure all issues, opportunities or biases that arose from the reading could be immediately engaged and resolved within the group.

The Team then used Voyant, a web-based reading and text analysis and visualization environment, to conduct word and phrase frequency analysis. The goal was to learn common topics, themes and phrases as well as the commonalities and strengths within the documents that could be replicated in the Guidelines, as well as identifying the gaps not addressed by the documents that the Guidelines emphasize.

**Figure III-1. Voyant text analysis and visualization used to develop the Guidelines**



The Guidelines are based on six core values, which the Team distilled from the document analysis performed on codes of practice as well as the use cases developed (with community and practitioner guidance) from the Measuring Reuse project. The Core Values include:

1. IDEAS (Inclusion, Diversity, Equity, Accessibility, Social Justice)
2. Privacy
3. Traditional Knowledge, Cultural Heritage, and Intellectual Property
4. Professional Development and Training
5. Transparency
6. Impartiality

The Team then engaged in an open commenting period during February 2021 with a broad representation of community practitioners for further examination and review. The Team distributed a call for participation in the open commenting period to groups led by or explicitly inclusive of historically or newly marginalized communities as well as bigger, general groups. Public feedback was incorporated in 2021, and in 2022 GLAMR experts were hired to review specific sections of the document (Privacy and Traditional Knowledge) that needed more extensive guidance that the D-CRAFT Team’s expertise could provide. The Guidelines will be published online in June 2023.

#### **IV. Developing Best Practices:**

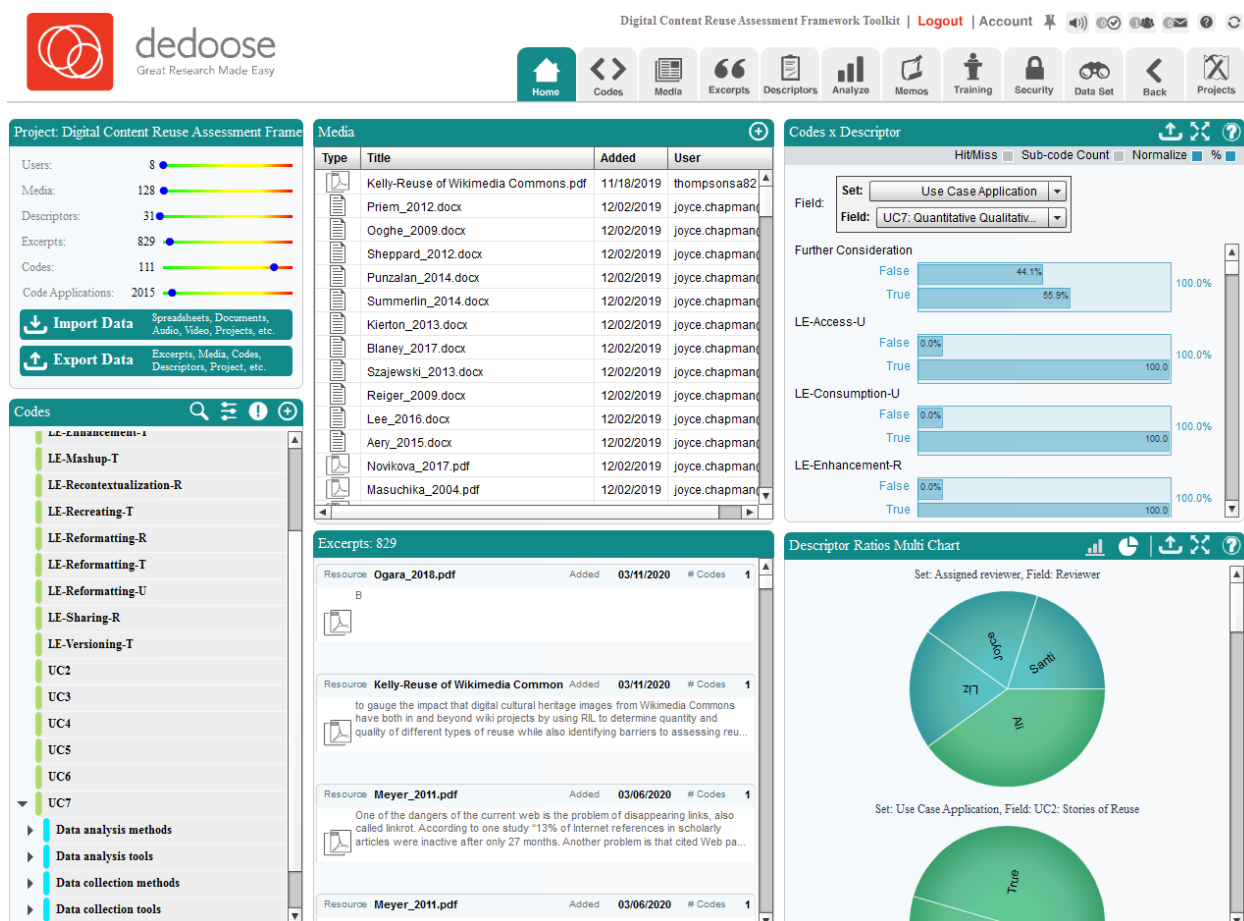
A central component of the D-CRAFT toolkit is the Recommended Practices for assessing reuse. The Recommended Practices are a suite of web pages that guide



practitioners through various methods to assess digital content use and reuse, as well as tools that can be employed to collect the data necessary to use each of the assessment methods.

To create the Recommended Practices, the Team began with a thorough literature review of materials published in 2010 and onward. The Team collected 135 articles and case studies and used Dedoose, a platform for collaboratively analyzing qualitative and mixed methods research data, to read through the materials, code topical content, and extract, organize, and tag excerpts, themes and topics.

**Figure IV-1. Dedoose qualitative text analysis used to develop the best practices for assessment**



After analyzing the Dedoose data and synthesizing the resulting coded data, the Team identified ten central methods currently in existence for collecting data about the reuse of digital content:

- Alert services
- Altmetrics
- Citation analysis

- Focus groups
- Interviews
- Link analysis
- Point of use surveys
- Reverse image lookup
- Surveys
- Web analytics

The Team also decided to include methods—such as web analytics—that focus on use assessment, even if the method cannot be used to assess reuse directly. From the use cases identified by participants in the Measuring Reuse grant, the Team noted that practitioners would likely need to assess both use and reuse to accomplish the same objective and many may be unfamiliar with methods for either. The Team would like the toolkit to provide helpful information for these practitioners, as well as those more focused on only reuse assessment.

The toolkit provides detailed information on each method, including information for beginning practitioners as well as advanced practitioners. While a few of the better-known methods already have extensive online documentation, the toolkit explains the method in an easy-to-understand way from the perspective of assessment in GLAMR institutions specifically. Documentation on each method includes the following:

- Definition
- Detailed explanation of how it is used for use and reuse assessment of digital content
- List of common tools that can be used to collect data for this method of assessment
- Recommended responsible practices that connect the Guidelines to the assessment method
- Strengths and weaknesses
- Highlighted examples that demonstrate this method in use at GLAMR institutions

Some methods additionally include supplementary materials. For example, the method “focus groups” is accompanied by sample recording permission forms, common ground rules, and a sample script.

The section on tools provides a link to a page documenting each tool. In some cases, the tools selected are the full extent of tools available for the method in question. For other methods—such as surveys—there are so many tools that the Team simply selected several that were the most used by or accessible to GLAMR institutions, or that had capabilities to do specific functions for the assessment method. As with the Methods, information on tools is organized into categories including:

- How to use the tool specifically for use and reuse assessment
- Ethical guidelines specific to the tool
- Strengths and weaknesses of the tool for each method to which it applies, including strengths and weaknesses specifically in comparison to the other tools documented
- Other tools that can be used for the same method
- Real world examples (if available) such as linked case studies, articles, or blog posts

## **VI. Developing Engagement and Education Tools:**

Phase 2 of the D-CRAFT project translates the deliverables discussed above into online education and engagement tools. In 2022, D-CRAFT hired an Accessibility consultant and an Instructional Design consultant. Over the course of this year, the consultants have worked with the Team to build the D-CRAFT toolkit website and create educational tools to help digital library practitioners better understand the application of each assessment method. For each method, the Instructional Design consultant created an interactive tutorial using software called Articulate Rise 360. Articulate Rise is good for creating instructional websites with interactive activities, and it performs well on mobile devices with a responsive design. For the tutorial videos, the Instructional Design consultant used animation software called Vyond, and the D-CRAFT website is built on Wordpress using Elementor Pro to create the theme.

The tutorials each begin with a short, animated video that presents the basics of each assessment method, and includes both closed captions and a video transcript. After watching the video, the tutorials offer activities to review what you have learned, such as card matching activities or quizzes. According to best practices in instructional design, it is a good idea to not just have people passively read and watch content, but to provide interactions to help reinforce the learning. The toolkit site will become live by June 2023.

Figure VI-1. Reverse Image Lookup tutorial – Assessment method for the D-CRAFT toolkit

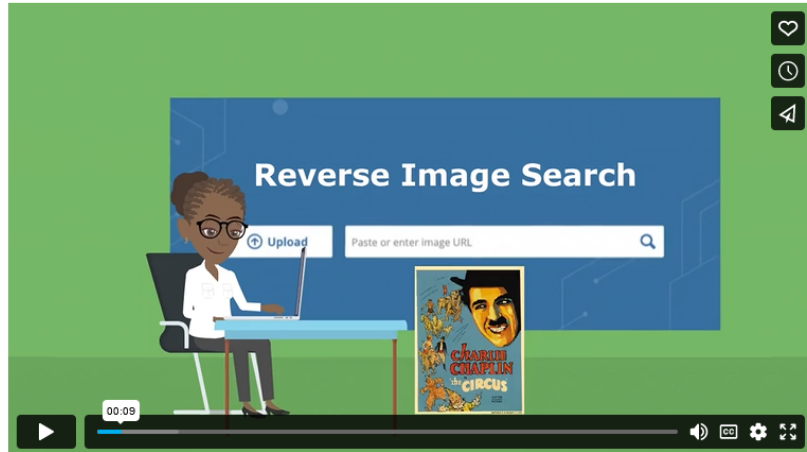


- Reverse Image Search
- Reverse Image Search Tools
- Tips
- Practice: search for uses of this image
- LEARN MORE
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## What is reverse image search?

Reverse image search (also called reverse image lookup) is a way you can search for images based on what the image looks like.

Learn more in this tutorial, or visit [D-CRAFT's full documentation on Reverse Image Search](#) for details.



### Video transcript

Reverse image search (also called reverse image lookup) is a way you can search for images based on what the image looks like. That's right! Instead of typing in words that name or describe an image, you can upload an image to one of these tools and it will try to find exact matches or similar images on websites.

## Figure VI-2. Reverse Image Lookup tutorial – “Review what you’ve learned” activity

The screenshot displays a tutorial interface for 'Reverse Image Search'. On the left is a navigation sidebar with a search icon at the top and a progress indicator '33% COMPLETE'. The sidebar contains several menu items: 'Reverse Image Search' (checked), 'Reverse Image Search Tools', 'Tips', 'Practice: search for uses of this image' (checked), 'LEARN MORE', 'Read these studies', and 'Credits'. The main content area is titled 'Review what you've learned' and includes the text: 'Now that you've learned a bit about reverse image searching, consider what you might find with these tools.' Below this is a question: 'Is it possible to find each kind of result on the cards below?' and an instruction: 'Drag each card to Yes or No.' A central card contains the text: 'A news media site that contains the image.' Below the card are two dashed boxes representing the 'Yes, it's possible to find.' and 'No, this won't be found.' options.

As each tutorial is created for an assessment method, the Team performs usability testing on the tutorial and uses the resulting feedback to refine and improve the product. The grant’s Assessment consultant recruited a pool of usability testers by putting a call out on the DLF Announce listserv that offered a \$20 gift card as an incentive for digital library practitioners who participated in a usability test. The Team received nearly 100 volunteers, and can now pull from this list as needed, making sure to match testers with tutorials on methods with which they are not already well acquainted. By conducting usability testing, the Team can get a sense for whether the tutorials are useful and what areas need more clarification. Test results have been helpful in refining the tutorials. The project Team will perform a second round of usability testing in January 2023 on the website at large.

The D-CRAFT toolkit will be live in June 2023 at the following URL: [reuse.diglib.org](https://reuse.diglib.org). Note that this URL currently contains older placeholder content, which will disappear when the toolkit is published.—Copyright 2022 Joyce Chapman, Nicole Hennig, Derrick Jefferson, Ranti Junus, Elizabeth Kelly, Ali Shiri, Ayla Stein Kenfield, Santi Thompson, Liz Woolcott

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Kenfield, A.S., et al. (2022). “Toward a definition of digital object reuse.” *Digital Library Perspectives* 38, no.3: 378–394.