

Altmetrics and Archives

Elizabeth Joan Kelly

J. Edgar & Louise S. Monroe Library

Loyola University New Orleans

Abstract:

Altmetrics are an alternative to traditional measurement of the impact of published resources. While altmetrics are primarily used by researchers and institutions to measure the impact of scholarly publications online, they can also be used by archives to measure the impact of their diverse online holdings, including digitized and born-digital collections, digital exhibits, repository websites, and online finding aids. Furthermore, altmetrics may fill a need for user engagement assessments for cultural heritage organizations. This article introduces the concept of altmetrics for archives and discusses barriers to adoption, best practices for collection, and potential further areas of study.

Keywords:

Altmetrics, archives, assessment, libraries

Article Classification:

Article

This is a post-print [post-peer review] version of a manuscript originally published in *Journal of Contemporary Archival Studies*: Vol. 4 , Article 1. <http://elischolar.library.yale.edu/jcas/vol4/iss1/1>

Altmetrics and Archives

Introduction

The collection of stories about user experience and engagement with archives is an important but underdeveloped area of assessment that is hindered by lack of expertise among archivists and time for conducting user-based evaluations, as well as financial constraints in hiring experts to do so. While some archival assessment tools have been developed to aid in collecting user experiences, additional tools for automating and analyzing this data are still needed to make it a widespread practice for archives. At the same time, methods of communication with and about archives are increasing in part because of the prevalence of social media. Altmetrics are an alternative to traditional measurement of the impact of published resources. While altmetrics are primarily used by researchers and institutions to measure the impact of scholarly publications online, they can also be used by archives¹ to measure the impact of their diverse online holdings, including digitized and born-digital collections, digital exhibits, repository websites, and online finding aids. Furthermore, altmetrics may fill a need for user engagement assessment for cultural heritage organizations. This article introduces the concept of altmetrics for archives and discusses barriers to adoption, best practices for collection, and potential further areas of study.

What Are Altmetrics?

The term “altmetrics” was coined by Jason Priem in 2010 in the tweet, “I like the term #articlelevelmetrics, but it fails to imply *diversity* of measures. Lately, I’m liking #altmetrics.”² That same year, Priem, along with Dario Taraborelli, Paul Groth, and Cameron Neylon, released the “altmetrics manifesto.” The altmetrics website defines altmetrics as “the creation and study of new metrics based on the Social Web for analyzing, and informing scholarship.”³ The idea of altmetrics was initially targeted at researchers and journals measuring individual article and publication impact as an alternative to traditional citation impact.

The manifesto and subsequent research about altmetrics identify a number of advantages to measuring social media engagement. The impact of online resources can be measured more quickly using altmetrics than with citation, h-index, and journal impact, as altmetrics impact is not subject to scholarly publication cycles. In an increasingly digital landscape, scholars attempting to show the popularity of their work can do so almost immediately via social media, while waiting for publication cycles to complete and for papers to be cited by others may take

¹ For the purposes of this paper, the term “archives” will be used, but the guidelines given here may also be relevant to museums, galleries, and other cultural heritage organizations

² Jason Priem, Twitter post, September 28, 2010, 7:28 p.m., <https://twitter.com/jasonpriem>.

³ Jason Priem, Dario Taraborelli, Paul Groth, Cameron Neylon, “Altmetrics: About,” 2010, <http://altmetrics.org/about/>.

years. The impact of non-journal creations can also be measured more easily with altmetrics. Examples include sources like conference presentation slides, scripts, and videos; datasets; and self-published works like blogs. While these sources are not historically prevalent in scholarly citations, they may receive at least as much attention online as articles do, and this attention should be typified as impact.

In addition, altmetrics can look at impact outside of scholarly publishing or “the academy,” potentially resulting in the discovery of previously unidentified readers and increased focus outside of traditional scholarly consumption silos. While tenure and promotion committees may still focus mainly on disciplinary recognition of scholarly work, public acknowledgment and appreciation for this same work can help arguments for increases in funding and should not be overlooked.

Perhaps the most important and revolutionary aspect of altmetrics is that social media can (and should) be analyzed for conversations about publications, and context should be derived from the reason for mentioning or citing a work. Existing impact factor methodologies adopt a “quantity over quality” argument, ignoring the fact that citation does not always imply endorsement and that, in some cases, sources are included precisely because the author is disagreeing with them. Social media metrics can similarly be used strictly to showcase counts (such as “this article was re-tweeted twenty times”) but are much more effective when analyzed to show broader discussion about scholarly work. The substantive evaluation of conversations about online publications is an essential component of altmetrics.

Finally, while Journal Impact Factor (JIF) measures the impact of entire journals, altmetrics instead measure the impact of individual publications. JIF, like citation counts, does not measure the quality of work and, in fact, gives greater weight to the citability of specific journal titles than to the citability of individual articles. As open-source publishing increases and the sheer number of available journal titles rises exponentially, the focus on “core journals” as a means of determining the value of individual scholarship is progressively outdated. Altmetrics, with their focus on the item in question (whether that be a journal article, blog post, interview, data set, or representation of a conference presentation), are a more effective and transparent method of showing the significance of singular works.⁴

Since the introduction of the concept in 2010, scholarly literature has focused extensively on analyzing these proposed advantages of altmetrics as well as on looking for correlations between citation impact, journal impact, and altmetrics.⁵ Altmetrics services and tools largely

⁴ A brief but comprehensive history of bibliometrics and the subsequent rise of altmetrics can be found in Robin Chin Roemer and Rachel Borchardt’s “Introduction to Altmetrics,” *Library Technology Reports* 51, no. 5 (July 2015): 5–10, <https://journals.ala.org/index.php/ltr/article/view/5745>.

⁵ Cameron Barnes, in particular, finds weak correlations between altmetrics scores and citations, writing, “Altmetrics are better seen as an indicator of research consumption.” From “The Use of Altmetrics as a Tool for

target two related but distinct user groups: individual researchers and institutions. Both user groups look to measure the impact of their work for purposes including promotion, tenure, outreach, and soliciting and justifying grant funding. The evolving literature on altmetrics has begun to isolate increasingly specific subsets of these user groups, including the use of altmetrics by libraries—academic libraries, to be specific. An analysis of scholarly and more informal literature on altmetrics and academic libraries reveals a focus on five distinct use cases.

First, the library can and should play a significant role in promoting alternative methods of impact measurement (and their challenges) to researchers. Researchers may include university faculty, professional researchers outside of the university, and both undergraduate and graduate students looking to improve their tenure and promotion packets and applications for jobs and advanced study.⁶ Second, librarians are also scholars; they can, and should, use altmetrics to measure the impact of their own scholarly work.⁷ Third, librarians who work with institutional repositories (IRs) can use altmetrics to measure the impact of faculty and student works.⁸ Fourth, librarians and archivists who create digitized special collections (DSCs) can use altmetrics to measure use and engagement.⁹ And fifth, some libraries are using altmetrics in conjunction with circulation data and online journal usage statistics to support collections evaluation and development.¹⁰

Measuring Research Impact,” *Australian Academic & Research Libraries* 46, no. 2 (2015): 121, doi:10.1080/00048623.2014.1003174.

⁶ Ibid., 123; Anil Kumar Dhiman, “Bibliometrics to Altmetrics: Changing Trends in Assessing Research Impact,” *DESIDOC Journal of Library & Information Technology* 35, no. 4 (2015): 314, doi:10.14429/djlit.35.4.8505; Kathleen Reed, Dana McFarland, and Rosie Croft, “Laying the Groundwork for a New Library Service: Scholar-Practitioner & Graduate Student Attitudes toward Altmetrics and the Curation of Online Profiles,” *Evidence Based Library & Information Practice* 11, no. 2 (2016): 92, doi:10.18438/B8J047; Beth Sheppard, “By the Numbers: Bibliometrics and Altmetrics as Measures of Faculty Impact in the Field of Religion,” *Theological Librarianship* 9, no. 1 (2016): 28–36, <https://theolib.atla.com/theolib/article/view/410>; and others.

⁷ Altmetric, “What Are Altmetrics? Librarians,” *What Are Altmetrics* (2016), <http://www.whatarealtmetrics.com/who/librarians/>; ImpactStory Team, “4 Things Every Librarian Should Do with Altmetrics,” *ImpactStory Blog* (2014), <http://blog.impactstory.org/4-things-librarians-altmetrics/>; Roemer and Borchardt, “Introduction to Altmetrics,” 34.

⁸ Altmetric, “What Are Altmetrics?”; Dhiman, “Bibliometrics to Altmetrics,” 314; Stacy Konkiel and Dave Scherer, “New Opportunities for Repositories in the Age of Altmetrics,” *Bulletin of the Association for Information Science and Technology* 39, no. 4 (2013): 22–26, doi:10.1002/bult.2013.1720390408; Lisa A. Palmer, “Cultivating Scholarship: The Role of Institutional Repositories in Health Sciences Libraries,” *Against the Grain* 26, no. 2 (2014): 24–28.

⁹ Stacy Konkiel, Michelle Dalmau, and David Scherer, “Altmetrics and Analytics for Digital Special Collections and Institutional Repositories,” April 24, 2015, doi: 10.6084/m9.figshare.1392140.v1.

¹⁰ Altmetric, “What Are Altmetrics?”; Andrea Michalek and Mike Buschman, “Analyze This: Altmetrics and Your Collection—Statistics & Collection Development,” *Against the Grain* 26, no. 2 (2014): 80–81; Roemer and Borchardt, “Introduction to Altmetrics,” 33.

Current practice involving libraries and altmetrics thus focuses primarily on collecting alternative metrics to aid individuals in outreach and promotion, assessing use of IRs and DSCs, and evaluating and developing collections. With the exception of IRs and DSCs, there is little scholarship on how libraries can use altmetrics to track their own impact, and no scholarship yet on the potential use of altmetrics by archives and other cultural heritage institutions.

Social Media and Assessment

The lack of scholarship on altmetrics use by archives and cultural heritage institutions does not mean that these organizations are not using social media at all, however. In fact, research on the use of social media by archives is proliferating, but this research focuses on how archives can increase awareness of their holdings using social media as opposed to how social media can be used to measure the impact of archival collections. Still, some scholarship exists to guide repositories in planning and assessing their social media activities, and these guidelines point to a need for repositories to engage in and encourage conversation about their holdings using web technologies. Robert Schier, in “Digital Librarianship & Social Media: The Digital Library as Conversation Facilitator,” notes that “many [repositories] often use social media as a way of blithely promoting their content instead of as a way to establish trusted relationships with users.”¹¹ An empirical study of social media usage by 125 Association of Research Libraries institutions found that special collections departments were somewhat successful in using social media for promotional purposes but less successful at engaging with external constituents and developing relationships through web-based media.¹² Additional scholarship provides protocols for assessing the use of social media in promoting special collections but again lacks guidelines for collecting statistics and examples of user engagements outside of those from repository-created accounts.¹³

While not specific to social media, the value to archives of collecting user feedback, and the difficulty in doing so, is well established. In “The Practice, Power, and Promise of Archival Collections Assessment,” Martha O’Hara Conway and Merrilee Proffitt argue that focusing our

¹¹ Robert A. Schier, “Digital Librarianship & Social Media: The Digital Library as Conversation Facilitator,” *D-Lib Magazine* 17, nos. 7–8 (2011), doi:10.1045/july2011-schier.

¹² Melanie Griffin and Tomaro I. Taylor, “Of Fans, Friends, and Followers: Methods for Assessing Social Media Outreach in Special Collections Repositories,” *Journal of Web Librarianship* 7, no. 3 (2013): 255–71.

¹³ Fidelia Ibekwe-SanJuan and Elaine Ménard, “Preface: Archives, Libraries, and Museums in the Era of the Participatory Social Web,” *Canadian Journal of Information & Library Sciences* 39, nos. 3–4 (2015): 245–50; Adam Kriesberg, “Increasing Access in 140 Characters or Less: Or, What Are Archival Institutions Doing on Twitter?,” *The American Archivist* 77, no. 2 (2014): 534–57, doi: 10.17723/aarc.77.2.7661l201544xv5qr; Hillary Webb and Ken Laing, “Engaging with Social Media: The Emily Carr University of Art and Design Library Experience,” *Art Documentation: Journal of the Art Libraries Society of North America* 34, no. 1 (2015): 137–51, doi: 10.1086/680570; Felicia Williamson, Scott Vieira, and James Williamson, “Marketing Finding Aids on Social Media: What Worked and What Didn’t Work,” *The American Archivist* 78, no. 2 (2015): 488–513, doi: 10.17723/0360-9081.78.2.488; Jennifer Wright Joe, “Assessment of Social Media in the Library: Guidelines for Administrators,” *Journal of Library Administration* 55, no. 8 (2015): 667–80, doi: 10.1080/01930826.2015.1085251.

institutions on becoming more user-centered requires assessing archival holdings to ensure reduction of backlogs, successful outreach regarding existing collections, and strategic acquisition for new collections.¹⁴ It is also essential that we “know our collections” and how they are used in order to write grants, inform new accessions, and evaluate workflow and instruction.¹⁵ User-driven data—that is, how scholars use the tools we create—is the most critical data we can collect.¹⁶ Institutions lack methods for using data-driven decision-making to effect change as well as definitions of metrics that allow for cross-institutional comparison.¹⁷ Operational data that must be collected manually “can be expensive to extract, manipulate, and analyze, especially if additional labor is expended in transcribing manually created data into electronic systems (such as spreadsheets or databases) to facilitate tabulation and analysis.”¹⁸ Archivists value user feedback and evaluation but need standardized measures to collect it.¹⁹ A 2008 study involving focus groups to determine what archivists want from user studies found that archivists consider “success of the user’s most recent search or visit” to be the most valuable use metric.²⁰ One archivist noted that passive data collection (like web logs for evaluating use of web resources) was more feasible for most archives than user interviews, but others noted a lack of context for this data.²¹ Barriers to obtaining user feedback include a lack of expertise among archivists, time for conducting user-based evaluations, and financial constraints in hiring experts.²²

So far, existing projects for collecting archival statistics and metrics have included those specific to measuring the impact of digitized resources (examples are TIDSR: Toolkit for the Impact of Digitised Scholarly Resources, Archival Metrics, and E-metrics).²³ The Archival Metrics Toolkit

¹⁴ Martha O’Hara Conway and Merrilee Proffitt, “The Practice, Power, and Promise of Archival Collections Assessment,” *RBM: A Journal of Rare Books, Manuscripts and Cultural Heritage* 13, no. 2 (2012): 100.

¹⁵ Lisa R. Carter, “Articulating Value: Building a Culture of Assessment in Special Collections.” *RBM: A Journal of Rare Books, Manuscripts and Cultural Heritage* 13, no. 2 (2012): 95, <http://rbm.acrl.org/content/13/2/89>.

¹⁶ *Ibid.*, 96.

¹⁷ Joyce Chapman and Elizabeth Yakel, “Data-Driven Management and Interoperable Metrics for Special Collections and Archives User Services,” *RBM: A Journal of Rare Books, Manuscripts and Cultural Heritage* 13, no. 2 (2012): 129, <http://rbm.acrl.org/content/13/2/129>.

¹⁸ *Ibid.*, 131.

¹⁹ Wendy Duff, Jean Dryden, Carrie Limkilde, Joan Cherry, and Ellie Bogomazova, “Archivists’ Views of User-Based Evaluation: Benefits, Barriers, and Requirements,” *The American Archivist* 71, no. 1 (2008): 160–61, doi: 10.17723/aarc.71.1.y70837374478t146.

²⁰ *Ibid.*, 154.

²¹ *Ibid.*, 155–56.

²² *Ibid.*, 158.

²³ Diane E. Marsh, Ricardo L. Punzalan, Robert Leopold, Brian Butler, and Massimo Petrozzi, “Stories of Impact: The Role of Narrative in Understanding the Value and Impact of Digital Collections,” *Archival Science* 16 (2015): 5, doi: [10.1007/s10502-015-9253-5](https://doi.org/10.1007/s10502-015-9253-5).

further provides resources for evaluating the satisfaction of different user groups accessing an archive, and specific surveys for measuring the value of web resources and online finding aids.²⁴

Still, archives assessment shows a lack of “reliable measures of institutional impact or nuanced portraits of audience engagement.”²⁵ A 2015 year-long interdisciplinary study on assessing and demonstrating the value and impact of digitized ethnographic collections found that stories from users about their use of digital collections are crucial for collecting institutions to successfully demonstrate the significance of their holdings.²⁶ Quantitative data collection by cultural heritage institutions did not offer reliable metrics for measuring institutional engagement or “nuanced portraits of audience engagement,” and research showed that even though institutions collect quantitative data, they do not analyze it in order to reform policies. Barriers to assessment included lack of time and staffing to both collect and meaningfully interpret data.²⁷ One survey respondent even noted that Facebook captured the kind of user data they would like about their digital users.²⁸ Quantitative and qualitative assessment together provide a “very rich portrait of the effects that digitization efforts can have on institutions and communities” by illustrating the emotional impact of digitized materials.²⁹ Measuring community impact (not just academic or scholarly impact) is especially important for ethnographic collections, in part because of an increase in “lay public” use of digital resources—while the museum library may be reserved for “serious” researchers, digital collections are used by a much broader audience.³⁰

Finally, the Society of American Archivists (SAA)/Association of College and Research Libraries (ACRL) Rare Books and Manuscripts Section (RBMS) Joint Task Force on Public Service Metrics recently released a draft of “Standardized Statistical Measures and Metrics for Public Services in Archival Repositories and Special Collections Libraries.”³¹ These guidelines provide “standardized statistical measures for public services in archival repositories and special collections libraries.”³² Included are defined metrics for basic web log data and repository social media “reach” (like number of interactions and number of followers). The guidelines will aid in the previously identified problem of a lack of metrics definitions and subsequent difficulty in

²⁴ Wendy Duff, Elizabeth Yakel, Helen Tibbo, Joan Cherry, Aprille McKay, Magia G. Krause, and Rebecka Sheffield, “The Development, Testing, and Evaluation of the Archival Metrics Toolkits,” *The American Archivist* 73, no. 2 (2010): 569–99, doi: 10.17723/aarc.73.2.00101k28200838k4.

²⁵ Marsh et al., “Stories of Impact,” 5.

²⁶ Ibid.

²⁷ Ibid., 11–13.

²⁸ Ibid., 14.

²⁹ Ibid., 18.

³⁰ Ibid., 19.

³¹ SAA/ACRL-RBMS Joint Task Force on Public Service Metrics, “Standardized Statistical Measures and Metrics for Public Services in Archival Repositories and Special Collections Libraries—Version 1,” 2016, <http://www2.archivists.org/groups/saa-acrlrbms-joint-task-force-on-public-services-metrics/standardized-statistical-measures-an>.

³² Ibid.

comparing assessments across institutions, but, as they are based on quantitative measures, they will not aid in capturing user attitudes or use cases.

Altmetrics for Archives

Enter altmetrics, which may allow for quantitative data collection with less hands-on work by archivists. The evaluation of social media engagement with or about archives may help archives improve their outreach efforts and better develop relationships with online communities and potential researchers. In this context, the “alt” part of altmetrics may refer instead to alternatives to our existing performance metrics (number of patrons in the reading room, use per collection, and so on). Altmetrics research also tends to focus on the impact of scholarly research, even if the output of the research is a less formal publication like a blog or tweet; for archives, non-scholarly research such as that which contributes to genealogy, property history, and community research, to name a few, should also be considered valuable resources to investigate.

The potential benefits of archives using altmetrics are plentiful. Altmetrics can provide alternative methods of tracking use of collections, particularly outside of the reading room. Scholarly publications are more frequently being discussed outside of academic venues, and archives also may find that discussion of their collections more often occurs in virtual spaces. As these discussions increase online, archives will be able to show the impact and influence of their collections in both scholarly and non-scholarly environments.

In addition, altmetrics will aid archivists in discovering a more diverse and immediate representation of how collections are being used—and by whom—since altmetrics look beyond scholarly publications. Konkiel, Dalmau, and Scherer argue that “many collections are reused by the casual reader in ways that can leave traces of impact like unexpected references to the source collections on the Web in the form of memes, ‘fan’ websites, and other ‘pop culture’ formats. It is important that we measure how our collections are used and referenced ‘in the wild,’ by researchers and the general public alike.”³³ There is also potential here for a decrease in focus on the difference between “high” and “low” use of archives, a decrease in prioritizing the needs of scholarly or so-called “serious” researchers over the needs of the community user, genealogist, or internal stakeholder. While an analysis of the potentially damaging effects of existing archival description and access policies toward different communities is outside of the scope of this article, suffice it to say that the inclusion of altmetrics analysis in an archive’s assessment strategies could result in the revision of outdated policies and, ideally, in increased inclusion of more diverse collections and more diverse users.³⁴

³³ Konkiel, Dalmau, and Scherer, “Altmetrics and Analytics,” 4.

³⁴ Excellent research is being done on the challenges and benefits of both developing community archives and of access to archives by different communities that could be relevant to this argument, including Michelle Caswell, Marika Cifor, and Mario H. Ramirez, “To Suddenly Discover Yourself Existing”: Uncovering the Impact of

Archives may also find that they can improve other services by using altmetrics to influence decisions about accessions, digitization, and processing priorities, as discussion of user wants and needs in these areas may already be occurring online. Efforts toward crowdsourcing could additionally be capitalized on by finding interested communities in existing social networks. Archives may find success in appealing to public funding agencies by including altmetrics as proof of need in grant applications, as “short-term, web-based measures of impact have the potential to be highly attractive to agencies that are connected to interests of the general public.”³⁵ And, certainly, the collection of statistics and user stories about the use of archives will contribute to the further development of a culture of assessment in the cultural heritage sector, the importance of which cannot be overstated. Efforts to increase and improve access to archives must include not only home-grown efforts but also widespread, cross-institutional attempts at standardizing metrics. The availability of a corpus of assessments from archival altmetrics will aid not only individual institutions but the broader archival community and its potential users as well.

There are many potential metrics for archives. Mentions and shares of repositories and collections in social media, such as Facebook, Twitter, Tumblr, YouTube, and Instagram can be tracked in order to identify users of archives and also to mine feedback on collections and services in a less obtrusive manner than requesting users to fill out surveys.³⁶ Reuse of digitized and born-digital archival items in online exhibits, websites, videos, and more, collected via reverse image lookup tools, can be useful both in tracking interest in particular collections and in identifying items and collections for digitization and online publishing. Tools also exist to track direct links to repository websites and finding aids in online blogs, user-generated reference resources, and other referring sites (like Wikipedia and Google Scholar);³⁷ these sources supplement citation impact in showing additional means of referencing archives both within and outside of scholarly publishing. So do favorited, saved, and bookmarked repository web resources in both scholarly and non-scholarly reference tools including CiteULike, Zotero,

Community Archives, *The American Archivist* 79, no. 1 (2016): 56–81, doi: 10.17723/0360-9081.79.1.56; Dominique Daniel and Amalia Levi, eds., *Identity Palimpsests: Archiving Ethnicity in the U.S. and Canada* (Sacramento, CA: Litwin Books, 2014); recent blogs and interviews by Jarrett Drake (some of which are available at <https://medium.com/@jmddrake>); and Kristin R. Eschenfelder and Michelle Caswell, “Digital Cultural Collections in an Age of Reuse and Remixes,” *Proceedings of the Association for Information Science and Technology* 47, no. 1 (2010): 1–10, doi:10.1002/meet.14504701045, to name a few. Archival altmetrics studies would benefit greatly from aligning preexisting frameworks for increasing access to archives by marginalized communities and frameworks for developing community archives with altmetrics data collection.

³⁵ Roemer and Borchardt, “Introduction to Altmetrics,” 27.

³⁶ One advantage to the user survey is that it can imply or even require user permission to use the survey data as the archive sees fit; a brief discussion about the ethics of collecting social media data without user permission can be found in the “Challenges” section of this paper.

³⁷ Konkiel, Dalmau, and Scherer, “Altmetrics and Analytics,” 11.

Mendeley, Bibsonomy, and del.icio.us.³⁸ These tools were created so that researchers could manage their saved links and citations, but they also act as social networking tools that allow users to see how many times a source has been saved. A number of altmetrics studies have found correlations between saves in reference tools and eventual scholarly citations, so archives may also be able to use this data to predict future scholarly interest.

Archives may also locate and record mass media mentions of archives, collections, and even individual archivists, as these show attention to archives and may result in new audience awareness of the archive.³⁹ Online reviews of collections and exhibits are similarly valuable resources for evaluating the success of such outreach efforts and may also reach previously untargeted audiences. If reviews or news articles result in increased traffic or donations to the archives, the repository may use this information to convince administration to increase outreach and publication efforts.

Requests from users for high-resolution digitized content can be tracked as these requests may indicate plans for republishing or reusing archival materials,⁴⁰ and saving this data may allow archives to follow up with authors at a later date to locate published versions of their holdings—particularly if the digitized content is public domain and the author would not be required to request publishing permission from the archive. And, finally, timelines or stories of specific social media events, such as participation in #AskAnArchivist day, may also be assessed and shared. Summaries of these types of outreach activities, collected via social media storytelling tools like Storify, can provide compelling narratives of how archivists interact with users online. Archivists can also collect data regarding others' reuse of the archive's social media posts through the users' subsequent creation of timelines or stories.

There are a number of tools for collecting and analyzing altmetrics. The first category of tools is altmetrics data aggregators.⁴¹ There are currently three major aggregators, the first of which is Altmetric. Altmetric is a subscription altmetrics aggregator with tools and services targeted at funding institutions, individual researchers, research institutions, publishers, and even companies (like pharmaceutical companies) with research and development departments. Altmetric mines a combination of scholarly and non-scholarly resources including text-based publications as well as multimedia. The service tracks a number of different scholarly identifiers; those most relevant to archives are Digital Object Identifiers (DOIs), International

³⁸ Paul Groth and Dario Taylor, "Helping Scholars Tell Their Stories Using Altmetrics," *Library Connect Newsletter: The Social Library* (2013), <http://libraryconnect.elsevier.com/articles/supporting-users-organizations/2013-08/helping-scholars-tell-their-stories-using-altmetrics>; Dhiman, "Bibliometrics to Altmetrics," 312.

³⁹ Groth and Taylor, "Helping Scholars."

⁴⁰ Konkiel, Dalmau, and Scherer, "Altmetrics and Analytics," 12.

⁴¹ Terminology taken from the National Information Standards Organization (NISO), "Altmetrics Data Quality Code of Conduct," *NISO*, 2016, http://www.niso.org/apps/group_public/document.php?document_id=16121&wg_abbrev=altmetrics-quality.

Standard Book Numbers (ISBN), Handles, and Uniform Resource Locators (URLs).⁴² “Altmetric Attention Scores” are displayed using the Altmetric “donut,” a color-coded graphic that shows the different altmetric data sources that have mentioned or linked to a source.⁴³

PlumAnalytics is another subscription altmetrics aggregator that offers products including PlumX Dashboards, PlumX Metrics, PlumX +Grants, PlumX Funding Opportunities, and PlumX Benchmarks. As can probably be gleaned from the product titles, PlumAnalytics distinguishes itself by focusing on researchers and institutions looking to receive and/or distribute grant funding, and PlumX Metrics is designed to integrate with IRs. However, PlumX Metrics is usable by institutions without IRs so long as they can provide unique identifiers for tracking, and the company defines sixty-seven different types of “artifacts” that they can gather altmetrics about.⁴⁴ PlumX tracks these artifacts using over twenty different types of identifiers including DOIs, ISBNs, Online Computer Library Center (OCLC) identifiers, Vimeo identifiers, YouTube identifiers, and URLs.⁴⁵ Like Altmetric, PlumX uses a color-coded, graphic widget (called the “Plum Print”) to show the amount and type of online attention a source has received.⁴⁶

Unlike the previous two aggregators, Impactstory is free and open source. It is funded by the National Science Foundation and the Alfred P. Sloan Foundation and targeted at individual researchers. Registration for Impactstory requires an ORCID (a persistent digital identifier) or a Twitter account. Once a researcher has created and synced their ORCID and/or Twitter, Impactstory gathers data from Altmetric, BASE, Mendeley, CrossRef, ORCID, and Twitter⁴⁷ and provides data using “achievements” badges (such as how open a researcher’s publications are, what their global reach is, how many followers their followers have) as well as “activity” data (how many times publications have been saved or shared across different networks, for example). Since Impactstory must be tied to an individual account via either Twitter or ORCID, it is less suited for use by archives than Altmetric or PlumAnalytics. However, the thought of using Impactstory to track finding aids authored by an individual archivist is an intriguing one.⁴⁸

⁴² Altmetric Support, “What Scholarly Identifiers Are Supported by Altmetric?,” 2016, <https://help.altmetric.com/support/solutions/articles/6000134562-what-scholarly-identifiers-are-supported-by-altmetric->

⁴³ Altmetric, “The Donut and Altmetric Attention Score,” <https://www.altmetric.com/about-our-data/the-donut-and-score/>.

⁴⁴ Plum Analytics, “About Artifacts,” <http://plumanalytics.com/learn/about-artifacts/>.

⁴⁵ Plum Analytics, “PlumX Widgets,” 2016, <https://plu.mx/developers/widgets>.

⁴⁶ Plum Analytics, “The Plum Print: Coming to a Result List Near You,” 2016, <http://plumanalytics.com/plum-print-coming-result-list-near/>.

⁴⁷ Impactstory, “About the Data,” 2016, <https://impactstory.org/about/data>.

⁴⁸ The same goes for systems and services that identify altmetrics impact for individual publications, such as ResearchGate, PLOS Article-Level Metrics, CrossRef Event Data (beta), and Figshare. However, further discussion about who gets authoring credit for online finding aids will need to occur to develop possible procedures.

The use of altmetrics data aggregators may be an immediate reality for archives housed in larger institutions that also maintain IRs, open journals, or other online publications, as these institutions may already have subscriptions to these services. Stand-alone archives or those housed in institutions that do not currently subscribe to altmetrics data aggregators should consider what resources they might want to track as well as what types of identifiers would be used for tracking to help inform which service would be most useful and whether subscription would be beneficial in terms of cost.

Altmetrics can also be collected ad hoc using free and open-source tools. Altmetric data providers,⁴⁹ or platform-specific application programming interfaces (APIs) and tools for collecting, can be used to mine data from Facebook, Twitter, Tumblr, Goodreads, del.icio.us, YouTube, SlideShare, GitHub, Instagram, and more. These are especially helpful for content that does not have a Handle or DOI,⁵⁰ but also may require programmers to develop new tools to automate collection.

One of the easiest options for collecting mentions and links is the free tool Google Alerts.⁵¹ Archives can set up alerts that will be emailed either as new results are found, at most once a day, at most once a week, or bundled together as a digest. Alerts can either be triggered by text strings or by URLs.

Altmetric provides some free tools for researchers, including a bookmarklet and embeddable badges. The bookmarklet can be installed on Chrome, Firefox, or Safari web browsers and used to see Altmetric scores as well as links to the Altmetric page for the source that then links to places the source has been mentioned, saved, or cited online. However, it only works on PubMed, arXiv, or webpages containing a DOI, so archivists may find limited functionality for their web-based resources. Similarly, the embeddable badges allow embedding of the Altmetric “donut” on webpages for sources that have a DOI.

Web scraping and web archiving tools that were invented for creating social media and web archives may be an option for archives attempting to harvest and preserve their own institution’s social media and web content (as is the case of ArchiveSocial and Archive-It), or for collecting social media content not necessarily generated by their institution using hashtags, usernames, or other search entries (example services include Lentil, ScraperWiki, Social Feed Manager, Twarc, and TAGS).⁵² Social media storytelling tools like Storify can also be used to curate social media collections and display them via the Storify interface or export them as PDF, HTML, XML, or JSON files. Reverse image lookup tools for finding reuse of images on websites

⁴⁹ NISO, “Altmetrics Data Quality.”

⁵⁰ Konkiel, Dalmau, and Scherer, “Altmetrics and Analytics,” 16.

⁵¹ Ibid.

⁵² “Social Media Archives Toolkit—Collecting Strategies,” North Carolina State University Libraries, 2014, <https://www.lib.ncsu.edu/social-media-archives-toolkit/collecting>.

and in multimedia include TinEye and Google Images, but both tools require that images must be searched for individually; as a result, these tools are best used with small sample sets of images.

Additional altmetrics tools and services exist that are more relevant to scholars and institutions looking at metrics for scholarly publications than for archives. For example, publisher websites may integrate altmetrics data in the form of badges, visual summaries, or in metrics reports.⁵³ These types of altmetrics services are less likely to be applicable to archives collecting altmetrics unless the archive wants to show the impact of scholarly publications that reference their materials—a somewhat combined altmetric/bibliometric assessment (for example, “Article X cites Collection Y from Repository Z; Article X has been tweeted two hundred times”). Additionally, some publishers, like the Public Library of Science, have created their own open-source altmetrics software;⁵⁴ archives with sufficient information technology support may be able to modify these tools to work with online archival resources.

Challenges

Of course, archives implementing new assessment strategies, particularly those involving developing metrics and technologies, may face some difficulties. Perhaps the most frequently cited criticism of altmetrics has to do with the definition of impact. Critics argue that social media recognition of research does not necessarily imply research endorsement and that “quirky, off-beat, salacious or humorous topics” acquire higher altmetrics scores than they “should” based on research value alone.⁵⁵ Even Euan Adie, the founder of Altmetric, has stated, “For the record at altmetric.com we calculate a metric—the Altmetric score—that measures attention. . . . If you want to assess quality then read the paper itself.”⁵⁶ Altmetrics must also be differentiated from social media metrics that are quantitative measurements of engagement with and reach of social media accounts. Social media metrics measure user interactions without regard to context, such as whether the interactions are in reference to research.⁵⁷ Thus, quality of impact must be derived both from the *amount* (or quantity) of attention or engagement with an online source as well as from the *quality* of said attention or engagement. Neither quantity nor quality of altmetrics are objective measurements; determining what is a considerably large amount of attention as well as what constitutes acceptably rigorous or informed online engagement will vary depending on the original source. Furthermore, even if a consensus for definitions of impact can be reached, aggregate-level altmetrics and comparative

⁵³ Altmetric, “Where Can I Find Altmetrics?,” *What Are Altmetrics?*, 2016, <http://www.whatarealtmetrics.com/where/>.

⁵⁴ Ibid.

⁵⁵ Ibid., 127.

⁵⁶ Ibid.

⁵⁷ Altmetric, “What Are Altmetrics? A Definition,” *What Are Altmetrics?*, 2016, <http://www.whatarealtmetrics.com/what/>.

institutional analyses are needed to determine what is “high impact” versus “low impact.”⁵⁸ Levels of impact will also vary depending on the type of material being measured—impact may be different for teaching materials than for items in IRs or DSCs.⁵⁹ One recommendation is to distinguish impact “as longer-term value over time,” leaving the measurement open to interpretation depending on discipline.⁶⁰

Ultimately, altmetrics are not meant to replace preexisting impact metrics altogether, as “correlation and factor analysis suggest citation and altmetrics indicators track related but distinct impacts, with neither able to describe the complete picture of scholarly use alone.”⁶¹ Still, archives attempting to collect altmetrics should heed some well-documented warnings prevalent in the altmetrics literature. Some difficulties are inherent in the nature of social media as a medium, while others are specific to individual social media platforms. Archivists should note that altmetrics are only as effective as the data they collect, and that this might be hindered by a lack of access to private or hidden social media—any reporting of altmetrics should be careful to define that the metrics collected reflect what was available for collection and may not include all existing data. In a similar vein, the ethics of collecting and sharing social media data without getting user permission is an important issue that is already being discussed in various venues in regard to social media and web archiving, and is an essential consideration for transparent altmetrics collection.⁶² Then there is the issue of social media platform terms of service (TOS)—some altmetrics services are free for researchers but require subscriptions for institutional use, while others restrict or explicitly prohibit harvesting of data without securing permission first. Archives will need to investigate TOS for individual platforms before collecting, and also consult TOS when determining how and with whom altmetrics data is shared.

Other challenges to altmetrics have less to do with the nature of social media and more to do with assessment as a whole. Non-standardized metrics and collecting measures are an ongoing issue, leading to data quality issues and difficulty in creating cross-institution comparisons; this

⁵⁸ Robin Chin Roemer and Rachel Borchardt, “Institutional Altmetrics & Academic Libraries,” *Information Standards Quarterly* 25, no. 2 (2013): 14, doi: [10.3789/isqv25no2.2013.03](https://doi.org/10.3789/isqv25no2.2013.03).

⁵⁹ Konkiel, Dalmau, and Scherer, “Altmetrics and Analytics,” 19.

⁶⁰ Marsh et al., “Stories of Impact.”

⁶¹ Jason Priem, Heather A. Piwowar, and Bradley M. Hemminger, “Altmetrics in the Wild: Using Social Media to Explore Scholarly Impact,” *arXiv* (2014): <http://arxiv.org/abs/1203.4745>.

⁶² North Carolina State University Library’s “Social Media Archives Toolkit” includes a section on “legal and ethical implications” of collecting social media data without permission, and the DocNow project (<http://www.docnow.io/>) is currently conducting research on collecting and preserving social media documentation of historically significant events, with “a strong commitment to prioritizing ethical practices when working with social media content.” DocNow’s work in this area will be crucial for archives interested in collecting altmetrics, particularly if the altmetrics will be shared. Archives altmetrics should also align with local practice on anonymizing user data. Eira Tansey provides a well-researched annotated bibliography on “archival ethics, online privacy, and the right to be forgotten” on her website at <http://eiratansey.com/2015/04/24/pda15bib/>.

issue will be particularly relevant for developing a culture of assessment in archives.⁶³ Similarly, altmetrics may be “gamed,” and despite long-standing examples of the same threat to citation and journal impact, detractors frequently point to this as a reason for avoiding altmetrics altogether.⁶⁴

Altmetrics tracking is not a perfect science, and archivists may find some difficulties in collecting data. One issue in particular is the difficulty in tracking web-based resources that utilize non-persistent URLs or URL shorteners.⁶⁵ Many archives post their finding aids online using simple web links that are prone to domain name moves and link rot, and a lack of persistent URLs may prove to be a hindrance to many archives trying to track direct links to their finding aids. Additionally, if users employ URL shorteners like tinyurl.com, bitly.com, and goo.gl to shorten repository website or finding aid URLs, not all altmetrics tools will be able to identify the original links. Tracking multiple versions of the same thing (for example, both a PDF and HTML version of a finding aid) may also complicate collection, and many archives employ this as a method of providing increased access to their finding aids.⁶⁶

Lastly, altmetrics is still relatively new. Readily identifiable tools for archives altmetrics are lacking, as tools, applications, and platforms for both citation analysis and altmetrics to date have been geared toward the scientific disciplines.⁶⁷ Because of this and the previously identified challenges, all of this collecting can be very labor-intensive, especially if using ad-hoc tools, and archives will need to perform time studies to measure whether altmetrics data is valuable enough to justify the time needed to collect it.

Steps are being taken to begin limiting or even erasing some of these challenges. Most important is the National Information Standards Organization (NISO) “Altmetrics Data Quality Code of Conduct” draft, which was available for public review and comment from February 25 to March 31, 2016.⁶⁸ The guidelines are meant to inform altmetrics data providers and aggregators by addressing issues of how metrics are defined and made available to organizations that wish to use altmetrics. However, the guidelines are “not concerned with the

⁶³ Konkiel, Dalmau, and Scherer, “Altmetrics and Analytics,” 17; Stefanie Hausteine, “Grand Challenges in Altmetrics: Heterogeneity, Data Quality and Dependencies,” *Scientometrics* 108, no. 1 (2016): 415–18, doi: 10.1007/s11192-016-1910-9.

⁶⁴ Meredith Brown, “Is Altmetrics an Acceptable Replacement for Citation Counts and the Impact Factor?,” *Serials Librarian* 67, no. 1 (2014): 30, doi: 10.1080/0361526X.2014.915609; Konkiel, Dalmau, and Scherer, “Altmetrics and Analytics,” 8. “Gaming” in both citation metrics and altmetrics refers to a user or journal’s ability to artificially inflate their own metrics. However, according to Roemer and Borchardt, gaming has proven to be less common than altmetrics skeptics originally feared (“Introduction to Altmetrics,” 32).

⁶⁵ Konkiel, Dalmau, and Scherer, “Altmetrics and Analytics,” 17.

⁶⁶ *Ibid.*, 9.

⁶⁷ Sheppard, “By the Numbers,” 35.

⁶⁸ NISO, “Altmetrics Data Quality.”

meaning, validity, or interpretation of indicators derived from that data,” so standards for collecting and interpreting altmetrics must be surmised from other sources.⁶⁹

Altmetrics Best Practices

Aligning altmetrics research with research and recommendations for assessing archives’ user experience, we can begin to formulate a set of best practices for archives to collect altmetrics. Assessment should begin by setting goals and defining audience.⁷⁰ Archives housed in academic institutions may be more inclined to focus on altmetrics involving scholarly researchers if institutional priorities dictate, while archives in public libraries or historical societies may be more interested in genealogists and community researchers. As evaluations of impact will vary based on the institution and its collections, examination of institutional mission and priorities will be essential to defining intended users of collections as well as the intended audience for altmetrics reports. It is important that archives use context when defining what “high impact” is and do not try to define impact the same way for different web sources or from different social media platforms.

Archives should be transparent about what has been collected and how.⁷¹ This point augments the previous one, as decisions about why certain metrics were chosen over others, as well as what tools were used to collect said metrics, will vary depending on the goals of the assessment and its intended audience.

Archives should also include context about what was collected (like percentiles comparing use of different collections, demographics of who is using, and data collection parameters).⁷² Again, different collections and different types of resources will have widely differing values for high and low impact; by comparing similar resources, it will be easier to gauge whether the resource had the sort of impact that the archives hoped. In addition, archives should take into account the likelihood that mentions or interactions from hidden or protected social media accounts may not show up in altmetrics data collection; it is therefore mandatory for archives to clarify statements about the population data was collected from (for example, include a statement that data was harvested from public accounts only).

Archives collecting altmetrics should try to understand and respect language and cultural norms specific to different social media platforms.⁷³ In collecting and evaluating user comments or

⁶⁹ Ibid.

⁷⁰ Rachael Hu, “Methods to Tame the Madness: A Practitioner’s Guide to User Assessment Techniques for Online Finding Aid and Website Design,” *RBM: A Journal of Rare Books, Manuscripts and Cultural Heritage* 13, no. 2 (2012): 181, <http://rbm.acrl.org/content/13/2/175.full.pdf>.

⁷¹ Konkiel, Dalmau, and Scherer, “Altmetrics and Analytics,” 17.

⁷² Ibid.

⁷³ Schier, “Digital Librarianship & Social Media.”

blog posts about archival holdings or online resources, the archivist must be attentive to the culture of a specific social media platform in order to best interpret any suggestions, accolades, or criticisms. Engagement in these platforms prior to collecting data may help educate the archivists about these factors. However, if the archive maintains social media accounts that have interacted with users, they should be transparent in altmetrics reports about this fact and the effect it may have had on the type of feedback and evaluation received.

Assessment statistics and reports should clearly differentiate between usage metrics,⁷⁴ social media metrics,⁷⁵ and altmetrics. All of these may be used in conjunction with each other to build a complete picture of use across various platforms and users, but differences in best practices for each of these measurements require that they be properly identified.

Altmetrics should be used for “like-for-like factors” instead of direct comparisons, as growth and evolution of social platforms would affect their altmetrics.⁷⁶ Increase or decrease in engagement with archival resources through a social media platform may have as much to do with changes in popularity for that platform as with changes in popularity for the archival resource. If comparing engagement with archival resources from one year to the next, archives should also include data about the social media platform’s general usage to show if that may have affected use of the measured resource.

Altmetrics should be collected both when institutional purposes require (such as when it is time to create annual reports) as well as with external reporting deadlines (like LibQual).⁷⁷ Doing so enables altmetrics inclusion in both types of reports and may help decrease the amount of time that must be dedicated to collection and analysis.

Archives should make their altmetrics reporting auditable (see COUNTER metrics, for example⁷⁸), open, and available (through selective licensing) for reuse.⁷⁹ Increased scholarship on the uses, advantages, and disadvantages of altmetrics are essential to building and defining metrics and best practices and for building benchmarks. Making archives’ altmetrics available for others to evaluate and analyze contributes to the culture of assessment necessary for creating a body of reliable research in this relatively new field. Similarly, releasing altmetrics to end users as soon as possible after data collection will ensure quick and easy access to data.⁸⁰

⁷⁴ Wolfgang Glänzel and Juan Gorraiz, “Usage Metrics versus Altmetrics: Confusing Terminology?,” *Scientometrics* 102, no. 3 (2015): 2161–64, doi: [10.1007/s11192-014-1472-7](https://doi.org/10.1007/s11192-014-1472-7).

⁷⁵ Altmetric, “What Are Altmetrics?”

⁷⁶ Groth and Taylor, “Helping Scholars.”

⁷⁷ Konkiel, Dalmau, and Scherer, “Altmetrics and Analytics,” 14.

⁷⁸ Counter homepage, <https://www.projectcounter.org/>.

⁷⁹ Konkiel, Dalmau, and Scherer, “Altmetrics and Analytics,” 17.

⁸⁰ *Ibid.*, 14.

Finally, archives should document failure as well as success.⁸¹ Altmetrics should not be curated to only include positive or helpful comments, nor should they be negated if engagement and impact are not as high as the archives hoped. Again, since this is a burgeoning field, especially in regards to archives, research needs to show if the collection of altmetrics is helpful, manageable, and actionable by archives of differing missions, institutional relationships, and sizes. If only success stories are published, the scholarly research will be artificially skewed toward a small number of studies that do not represent the full experience of collecting altmetrics for archives. Similarly, the sharing of altmetrics data that may not be what the archives had hoped for will enable other researchers to analyze the data and possibly come up with methods for increased and better impact.

Conclusion

Ultimately, the creation of ethical, scalable recommendations for archives to transparently collect and use altmetrics will be necessary in order for archival altmetrics to be informative and for collection practices to be reusable across institutions. Future research in this area should include studies about what archives' web content is indeed being talked about through social media as well as what archives are doing with this information to improve services. Research into the return on investment (ROI) of collecting altmetrics for archives and whether it is time efficient is also necessary, especially for institutions of differing sizes, to determine whether an altmetrics assessment plan is sustainable and beneficial.

While altmetrics is a relatively new field, it must be remembered that citation analysis took twenty years to be accepted as an accurate measure of journal impact, and that the recent evolution of altmetrics should not be a hindrance to new users.⁸² Capturing user feedback is essential for archives to identify who their users are, what they are doing, and what they would like to be doing, and altmetrics provide a potential means of collecting this data and improving archival holdings and services.

⁸¹ Marsh et al., "Stories of Impact," 32.

⁸² Groth and Taylor, "Helping Scholars."

Bibliography

- Altmetric. "The Donut and Altmetric Attention Score." Accessed January 24, 2017.
<https://www.altmetric.com/about-our-data/the-donut-and-score/>.
- . "What Are Altmetrics? A Definition." *What Are Altmetrics?* 2016.
<http://www.whatarealtmetrics.com/what/>.
- . "What Are Altmetrics? Librarians." *What Are Altmetrics?* 2016.
<http://www.whatarealtmetrics.com/who/librarians>.
- . "What Are Altmetrics? What Are Altmetrics?" *What Are Altmetrics?* 2016.
<http://www.whatarealtmetrics.com/what/>.
- . "What Scholarly Identifiers Are Supported by Altmetric?: Altmetric Support." 2016.
<https://help.altmetric.com/support/solutions/articles/6000134562-what-scholarly-identifiers-are-supported-by-altmetric->.
- . "Where Can I Find Altmetrics?" *What Are Altmetrics?*, 2016.
<http://www.whatarealtmetrics.com/where/>.
- Barnes, Cameron. "The Use of Altmetrics as a Tool for Measuring Research Impact." *Australian Academic & Research Libraries* 46, no. 2 (June 2015): 121–34. doi: 10.1080/00048623.2014.1003174.
- Brown, Meredith. "Is Altmetrics an Acceptable Replacement for Citation Counts and the Impact Factor?" *Serials Librarian* 67, no. 1 (2014): 27–30. doi: 10.1080/0361526X.2014.915609.
- Carter, Lisa R. "Articulating Value: Building a Culture of Assessment in Special Collections." *RBM: A Journal of Rare Books, Manuscripts and Cultural Heritage* 13, no. 2 (2012): 89–99. <http://rbm.acrl.org/content/13/2/89>.
- Caswell, Michelle, Marika Cifor, and Mario H. Ramirez. "To Suddenly Discover Yourself Existing": Uncovering the Impact of Community Archives. *The American Archivist* 79, no. 1 (2016): 56–81. doi: 10.17723/0360-9081.79.1.56.
- Chapman, Joyce, and Elizabeth Yakel. "Data-Driven Management and Interoperable Metrics for Special Collections and Archives User Services." *RBM: A Journal of Rare Books, Manuscripts and Cultural Heritage* 13, no. 2 (2012): 129.
<http://rbm.acrl.org/content/13/2/129>.

- Conway, Martha O'Hara, and Merrilee Proffitt. "The Practice, Power, and Promise of Archival Collections Assessment." *RBM: A Journal of Rare Books, Manuscripts and Cultural Heritage* 13, no. 2 (2012): 100–112. <http://rbm.acrl.org/content/13/2/89>.
- Daniel, Dominique, and Amalia Levi, eds. *Identity Palimpsests: Archiving Ethnicity in the U.S. and Canada*. Sacramento, CA: Litwin Books, 2014.
- Dhiman, Anil Kumar. "Bibliometrics to Altmetrics: Changing Trends in Assessing Research Impact." *DESIDOC Journal of Library & Information Technology* 35, no. 4 (July 2015): 310–15. doi: 10.14429/djlit.35.4.8505.
- DocNow. Accessed January 25, 2017. <http://www.docnow.io/>.
- Drake, Jarrett. *Medium*. Accessed January 25, 2017. <https://medium.com/@jmddrake>.
- Duff, Wendy, Elizabeth Yakel, Helen Tibbo, Joan Cherry, Aprille McKay, Magia G. Krause, and Rebecka Sheffield. "The Development, Testing, and Evaluation of the Archival Metrics Toolkits." *The American Archivist* 73, no. 2 (Fall/Winter 2010): 569–99. doi: 10.17723/aarc.73.2.00101k28200838k4.
- Duff, Wendy, Jean Dryden, Carrie Limkilde, Joan Cherry, and Ellie Bogomazova. "Archivists' Views of User-Based Evaluation: Benefits, Barriers, and Requirements." *The American Archivist* 71, no. 1 (2008): 144–66. doi: 10.17723/aarc.71.1.y70837374478t146.
- Eschenfelder, Kristin R., and Michelle Caswell. "Digital Cultural Collections in an Age of Reuse and Remixes." *Proceedings of the Association for Information Science and Technology* 47, no. 1 (2010): 1–10. doi: 10.1002/meet.14504701045.
- Glänzel, Wolfgang, and Juan Gorraiz. "Usage Metrics versus Altmetrics: Confusing Terminology?" *Scientometrics* 102, no. 3 (2015): 2161–64. doi: [10.1007/s11192-014-1472-7](https://doi.org/10.1007/s11192-014-1472-7).
- Griffin, Melanie, and Tomaro I. Taylor. "Of Fans, Friends, and Followers: Methods for Assessing Social Media Outreach in Special Collections Repositories." *Journal of Web Librarianship* 7, no. 3 (July 2013): 255–71. doi: 10.1080/19322909.2013.812471.
- Groth, Paul, and Dario Taylor. "Helping Scholars Tell Their Stories Using Altmetrics." *Library Connect*, August 26, 2013. <http://libraryconnect.elsevier.com/articles/supporting-users-organizations/2013-08/helping-scholars-tell-their-stories-using-altmetrics>.
- Haustein, Stefanie. "Grand Challenges in Altmetrics: Heterogeneity, Data Quality and Dependencies." *Scientometrics*, March 14, 2016. doi: 10.1007/s11192-016-1910-9.

- Hu, Rachael. "Methods to Tame the Madness: A Practitioner's Guide to User Assessment Techniques for Online Finding Aid and Website Design." *RBM: A Journal of Rare Books, Manuscripts and Cultural Heritage* 13, no. 2 (2012): 181. <http://rbm.acrl.org/content/13/2/175.full.pdf>.
- Ibekwe-SanJuan, Fidelia, and Elaine Ménard. "Preface: Archives, Libraries, and Museums in the Era of the Participatory Social Web." *Canadian Journal of Information & Library Sciences* 39, nos. 3–4 (2015): 245–50.
- Impactstory. "4 Things Every Librarian Should Do with Altmetrics." *Impactstory Blog*, June 25, 2014. <http://blog.impactstory.org/4-things-librarians-altmetrics/>.
- . "About the Data." 2016. <https://Impactstory.org/about/data>.
- Joe, Jennifer Wright. "Assessment of Social Media in the Library: Guidelines for Administrators." *Journal of Library Administration* 55, no. 8 (2015): 667–80. doi: 10.1080/01930826.2015.1085251.
- Konkiel, Stacy, Michelle Dalmau, and David Scherer. "Altmetrics and Analytics for Digital Special Collections and Institutional Repositories," April 24, 2015. doi: 10.6084/m9.figshare.1392140.v1.
- Konkiel, Stacy, and Dave Scherer. "New Opportunities for Repositories in the Age of Altmetrics." *Bulletin of the American Society for Information Science and Technology* 39, no. 4 (2013): 22–26. doi: 10.1002/bult.2013.1720390408.
- Kriesberg, Adam. "Increasing Access in 140 Characters or Less: Or, What Are Archival Institutions Doing on Twitter?" *The American Archivist* 77, no. 2 (October 1, 2014): 534–57. doi: 10.17723/aarc.77.2.76611201544xv5qr.
- Marsh, D. E., R. L. Punzalan, R. Leopold, B. Butler, and Massimo Petrozzi. "Stories of Impact: The Role of Narrative in Understanding the Value and Impact of Digital Collections—Springer." *Archival Science*, 2015, 1–46. doi: 10.1007/s10502-015-9253-5.
- Michalek, Andrea, and Mike Buschman. "Analyze This: Altmetrics and Your Collection—Statistics & Collection Development." *Against the Grain* 26, no. 2 (April 2014): 80–81.
- National Information Standards Organization (NISO). "Altmetrics Data Quality Code of Conduct." NISO. 2016. http://www.niso.org/apps/group_public/document.php?document_id=16121&wg_abbr=ev=altmetrics-quality.

- Palmer, Lisa A. "Cultivating Scholarships: The Role of Institutional Repositories in Health Sciences Libraries." *Against the Grain* 26, no. 2 (April 2014): 24–28.
- Plum Analytics. "About Artifacts." Accessed January 24, 2017. <http://plumanalytics.com/learn/about-artifacts/>.
- . "The Plum Print: Coming to a Result List Near You." 2016. <http://plumanalytics.com/plum-print-coming-result-list-near/>.
- . "PlumX Widgets." 2016. <https://plu.mx/developers/widgets>.
- Priem, Jason. Twitter post. September 28, 2010, 7:28 p.m. <https://twitter.com/jasonpriem>.
- Priem, Jason, Heather A. Piwowar, and Bradley M. Hemminger. "Altmetrics in the Wild: Using Social Media to Explore Scholarly Impact." *arXiv:1203.4745 [Cs]*, March 20, 2012. <http://arxiv.org/abs/1203.4745>.
- Priem, Jason, Dario Taraborelli, Paul Groth, and Cameron Neylon. "Altmetrics: About." 2010. <http://altmetrics.org/about/>.
- Project Counter. Accessed January 24, 2017. <https://www.projectcounter.org/>.
- Reed, Kathleen, Dana McFarland, and Rosie Croft. "Laying the Groundwork for a New Library Service: Scholar-Practitioner & Graduate Student Attitudes Toward Altmetrics and the Curation of Online Profiles." *Evidence Based Library & Information Practice* 11, no. 2 (April 2016): 87–96. doi: 10.18438/B8J047.
- Roemer, Robin Chin, and Rachel Borchardt. "Institutional Altmetrics & Academic Libraries." *Information Standards Quarterly* 25, no. 2 (Summer 2013): 14–19. doi: 10.3789/isqv25no2.2013.03.
- . "Introduction to Altmetrics." *Library Technology Reports* 51, no. 5 (July 2015): 5–10. <https://journals.ala.org/index.php/ltr/article/view/5745>.
- SAA/ACRL-RBMS Joint Task Force on Public Service Metrics. "Standardized Statistical Measures and Metrics for Public Services in Archival Repositories and Special Collections Libraries—Version 1." 2016. <http://www2.archivists.org/groups/saa-acrlrbms-joint-task-force-on-public-services-metrics/standardized-statistical-measures-an>.
- Schier, Robert A. "Digital Librarianship @ Social Media: The Digital Library as Conversation Facilitator." *D-Lib Magazine* 17, nos. 7–8 (July 2011). doi: 10.1045/july2011-schier.

- Sheppard, Beth. "By the Numbers: Bibliometrics and Altmetrics as Measures of Faculty Impact in the Field of Religion." *Theological Librarianship* 9, no. 1 (2016): 28–36.
<https://theolib.atla.com/theolib/article/view/410>.
- "Social Media Archives Toolkit—Collecting Strategies," North Carolina State University Libraries. 2014. <https://www.lib.ncsu.edu/social-media-archives-toolkit/collecting>.
- Tansey, Eira. "Annotated Bibliography for My Talk at Personal Digital Archiving 2015." April 24, 2014. <http://eiratansey.com/2015/04/24/pda15bib/>.
- Webb, Hillary, and Ken Laing. "Engaging with Social Media: The Emily Carr University of Art and Design Library Experience." *Art Documentation: Journal of the Art Libraries Society of North America* 34, no. 1 (2015): 137–51. doi: 10.1086/680570.
- Williamson, Felicia, Scott Vieira, and James Williamson. "Marketing Finding Aids on Social Media: What Worked and What Didn't Work." *The American Archivist* 78, no. 2 (2015): 488–513. doi: 10.17723/0360-9081.78.2.488.