

Robust 'Altmetrics' as a Framework for Measuring Item Usage and Researcher Impact in Institutional Repositories

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ABSTRACT

Select academic journal publishers and subject repositories have implemented tools that allow authors to see their "impact" at an article level. These usage indicators, called "altmetrics," measure article citations, download counts, pageviews, bookmarks on academic social reference manager sites, and mentions on Facebook and Twitter. Some altmetrics have been shown to predict the likelihood of papers receiving more traditional measures of impact such as citations (Eysenbach, 2011), and a growing number of scholars are calling for altmetrics' recognition as a supplementary measure of an article's influence (Neylon & Wu, 2009; Priem et al., 2010; Taraborelli, 2008). Should institutional repositories offer altmetrics for the research they hold? If so, which metrics? Which tools are best suited to aid in implementation? What barriers to participation exist for repository managers? Using examples from the research literature, academic publishers, and subject and institutional repositories, we explore these questions.

ALTMETRICS: A DEFINITION

Altmetrics measure the scholarly and popular usage of diverse scholarly outputs. Loosely defined, altmetrics include indicators that count how many times a research output (article, blog, dataset, grey literature, etc) has been:

- Viewed (Publisher websites, Dryad)
- Downloaded (Slideshare, publisher websites, Dryad)
- Cited (PubMed, CrossRef, Scopus, Web of Science)
- Reused/Adapted (Github)
- Shared (Facebook, Twitter, Reddit)
- Bookmarked (Mendeley, CiteULike, Delicious)
- Commented upon (Blogs, Wikipedia, F1000)

Where journal impact factors (often used to measure the value of individual research outputs) have been identified as too broad, not applicable to untraditional outputs (such as digital scholarship projects), and slow to reflect impact (Brody, Harnad, & Carr, 2006; Priem et al., 2010), altmetrics can provide item-level, up-to-the-minute glimpses of the impact of diverse research outputs (Neylon & Wu, 2009; Priem et al., 2010). Further, altmetrics are more transparent than the secretive impact factor formula (Priem et al., 2010).

Limitations include: limited use of author identifiers (to aid in disambiguation), low (or zero) metrics available for some items (Piwowar & Priem, 2012), susceptibility to gaming (Abbott et al., 2010), and lack of mainstream adoption.

METHODS

These preliminary findings are based upon research into the three most popular web services that provide altmetrics data to third parties: ImpactStory (formerly Total-Impact), Altmeter, and Plum Analytics.

When determining the usefulness of applying altmetrics in institutional repositories, it was prudent to choose the three most popular types of repository platforms, based upon Registry of Open Access Repository (ROAR) reports: Bepress Digital Commons, Eprints, Dspace.

I have compared the types of metrics already reported by the three repository platforms and each altmetrics service, identify strengths and weaknesses of each altmetrics service, and make recommendations for which tools would be best used, in the context of repository platform. Finally, a literature review was conducted to find existing answers to the research questions posed.

IR SOFTWARE PLATFORMS & EXISTING METRICS



- Proprietary, non-configurable platform
- Existing metrics:
 - Download counts
 - Search terms used to access
 - Referral links
- Metrics displayed via:
 - Email to authors
 - Author Dashboard (private) interface



- Open source, configurable platform
- Existing metrics:
 - Downloads
- Metrics displayed openly, where enabled
 - Repository-, collection- and item-level
- Metrics visualizations available:
 - Line, bar, pie graphs
 - HTML table
 - CSV export



- Open source, configurable platform
- Existing metrics:
 - Downloads
- Metrics displayed openly (where enabled) or to administrators only
 - Repository-, community-, collection- and item-level
- Metrics displayed via HTML table

DISCUSSION

IRs should provide altmetrics, to three ends: Proving IR value to the institution (Borgman & Larsen, 2003; Organ, 2006; Priem et al., 2010); proving IR value to researchers (Zuber, 2008; Organ, 2006); and helping track researcher success for the institution (Russell & Rosseau, 2008; MacColl, 2010)

The metrics that should be provided, based on implementation in top altmetrics services, would track scholarly impact (Page views/abstract views, Downloads, Citations (Scopus, PubMed Central), Bookmarking (Mendeley, CiteULike), Faculty of 1000 reviews, and blog mentions (research blog networks)) and popular impact (Wikipedia mentions, Bit.ly clicks and shares, Facebook, Delicious bookmarks, Reddit mentions, Twitter mentions and influential tweets, blog mentions (general interest blogs), and news outlet mentions).

Recommended tools are ImpactStory for Open Source repository platforms and Plum Analytics for proprietary platforms (where metrics would likely not be displayed).

Barriers to participation that exist are those of cost, IR technical support resources, inability to incorporate tools into proprietary platforms, limited DOI implementation in most repositories, and the political implications of displaying non-existent metrics for relatively unpopular IR materials.

Further areas for development are to survey faculty, librarian, and university administrator attitudes towards altmetrics (already under way), and the wide-scale IR implementation of DOIs and author identifiers, such as ORCID.

RESULTS: EVALUATION OF ALTMETRICS SERVICES



- Paid service tracks usage of: DOIs, PubMedIDs, arXiv IDs
- Strengths
 - Context-based metrics
 - Free (limited use) API available
 - Boolean querying and filtering
 - Reports and visualizations
- Weaknesses
 - Aimed at commercial publishers
 - Does not track pageviews/downloads
 - Does not track non-traditional outputs



- Free service tracks usage of: DOIs, PubMedIDs, URLs, Slideshare, Github, Dryad
- Strengths
 - Context-based metrics
 - Free, fully open API
 - Tracks variety of research outputs
 - Embeddable reports
- Weaknesses
 - Does not track pageviews/downloads
 - Labor intensive to create reports
 - No paid technical support



- Paid service tracks usage of: articles, books, clinical trials, datasets, figures, grants, presentations, source code, videos
- Strengths
 - Could incorporate IR stats into reports
 - Uses library-based stats (ILL, circulation)
 - Data browseable beyond numbers
 - Greatest diversity and number of altmetrics
- Weaknesses
 - No API available (for now)



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