September 2012

The Measure of Usage, the Usage of Measures: Article Level Metrics at PLoS

Jennifer Lin

Public Library of Science, jlin@plos.org

Follow this and additional works at: <https://docs.lib.purdue.edu/atg>

Part of the [Library and Information Science Commons](#)

Recommended Citation

Lin, Jennifer (2012) "The Measure of Usage, the Usage of Measures: Article Level Metrics at PLoS," *Against the Grain*: Vol. 24: Iss. 4, Article 12.

DOI: <https://doi.org/10.7771/2380-176X.6180>

This document has been made available through Purdue e-Pubs, a service of the Purdue University Libraries. Please contact epubs@purdue.edu for additional information.

The Measure of Usage, the Usage of Measures: Article Level Metrics at PLoS

by **Jennifer Lin** (Product Manager, Public Library of Science) <jlin@plos.org>

Librarians have long since utilized usage counts for journal articles as a measure of value to maximize their acquisitions budgets. With significant decreases in library budgets, librarians rely on COUNTER-compliant usage reports for the data they need to make pivotal decisions regarding which subset of published research they will be able to make available to their community. Librarians have employed these measurements for over a decade in their work, while researchers are also increasingly tracking the reach of their work in this fashion.

The broader research community, which encompasses university administration (hiring and tenure/promotion decision makers), funders, and publishers, is entrenched in the prevailing paradigm of measuring the importance of a publication based on the journal that published the article. This approach is beginning to evolve as a more diverse, comprehensive set of metrics is made available. Leading this shift are bibliometricians, research scientists, publishers, and policy-makers, who are innovative in the use of alternative metrics, such as article-level measurements of activity.

Article-Level Metrics

Public Library of Science (PLoS) is the first publisher to actively present measures of impact at the article level, which provides a more focused and granular understanding of the importance and reach of a piece of research.

PLoS has long been aware of the value of measuring the reach of individual articles, creating Article-Level Metrics (ALMs) in 2009 (<http://article-level-metrics.plos.org/>). ALMs display transparent and comprehensive information about the usage and reach of a published article on the articles page so that the entire academic community can assess the article's value based on what is relevant and important to their discipline.

ALMs offer direct, first-hand views of the dissemination and reach of a research article through an ever-increasing range of different metrics, from the more traditional usage and citation data to the mosaic of social media data. This multi-dimensional suite of indicators captures the research footprint from the moment of publication and dynamically tracks its impact over time. ALMs provide additional and regularly-updated context to the article far in advance of the period in which citations begin to accrue (which can be years after the article's publication date). This diverse set of impact indicators offers numerous ways to assess and navigate research most relevant to the field itself, including: usage, citations, social bookmarking, and dissemination activity, media and blog coverage, and discussion activity and ratings.

The following chart details our existing ALMs offering:

Category	Metric
PLoS Article Usage	HTML page views PDF downloads XML downloads
PMC Article Usage	HTML page views PDF downloads
Community Input (PLoS)	Reader Comments Reader Notes Ratings
Citations in Scholarly Literature	PubMed Central Scopus CrossRef Web of Science
Blogs and Media Coverage	Nature Blogs Research Blogging Google Blogs (direct search link) Trackbacks
Social/Behavioral Mining	CiteULike Connotea Facebook Mendeley Twitter* (launching soon)

The digital environment of today's research enables the collection and analysis of many more data sources and types than ever before. ALMs provide much-needed new checks and balances, greater speed of feedback, and superior relationship mapping and influence tracking, none of which can be replicated by the traditional impact factor. Given the need for more granular, article-level rating and recommendation systems, literature shows that the potential of peer review and recommendation systems is greatly enhanced by various new media and crowdsourcing tools. Different types of Web services, such as social bookmarking, social reference management, social news/recommendations, publisher-hosted comment spaces, and data repositories, all provide insights into the various types of impact that are possible. They can provide post-publication peer review that assists researchers in the assessment of research articles on their own merits and establishes scholars' authority, augments peer review, broadens the scope of existing measures of impact that are tied to journal or publisher brand, and provides ways of discovering and filtering articles. Furthermore, ALMs are a transparent way of mapping and analyzing personal relationships between scientists — making them more quantifiable than ever before — and allowing researchers to estimate which scholarly articles and journals are truly central to their individual flow of information. By using these Web services to collect ALMs on research, we can also cross-validate different

types of metrics against each other, providing a useful set of checks and balances.

ALMs and the Power to Transform

No single metric alone can represent research impact, but as a suite of indicators, ALMs provide a more comprehensive view than ever before.

Considered altogether, they have transformative potential across multiple areas in research:

- **Research assessment**

- Evaluation based on merits of actual research instead of the publishing journal

- In-depth, informed perspective for decision-making (funding, promotion, research ingestion, etc.) supported by transparent, comprehensive measures of impact

- **Research navigation**

- Personalized literature search (navigate, filter, and sort) for focused research discovery

- Enhanced research discovery with valuable recommendations based on collective intelligence indicators

- **Research monitoring and tracking**

- Efficient, streamlined way to stay informed of recent publications in a specific field and at large

continued on page 46

The Measure of Usage ... from page 42

— Survey of latest research trends based on most current metrics of article impact

• Research process

— Up-to-date view of research progress, which can be easily shared with others (funders, promotion boards, etc.)

— Enhanced project design and implementation with an enhanced and precise view of research developments in any field

— Informed selection of collaborators based upon the impact of their work and relevance to yours

To further contribute to its productive potential, ALMs have numerous touch points across the research process timeline where they can be deployed to support and drive the researcher's work.

against the grain people profile

Jennifer Lin

BORN AND LIVED: Raleigh, NC. Currently residing in Berkeley, CA.

PROFESSIONAL CAREER AND ACTIVITIES: I am the product manager at **Public Library of Science**. I am passionate about open access and its political and social impacts. As a former business consultant with **Accenture**, I worked with Fortune 500 companies as well as governments to develop and deploy new products and services. I received my Ph.D. in political philosophy and have served as an instructor at **Johns Hopkins University**. 🌱

Product Manager, Public Library of Science
1160 Battery St, Suite 100, San Francisco, CA 94111
Phone: (415) 935-2095 • Fax: (415) 546-4090
<jlin@plos.org>

of these offerings further extend the potential for ALMs to impact scholarly research.

Myriad challenges exist in gathering, storing, and making ALMs data available. Third-party data sources are not always consistent or reliable. In addition, significant processing power is needed to churn through these data sources on a daily basis. Understanding and handling possible methods of gaming ALMs data is another challenge that PLoS is undertaking. PLoS is collaborating with other publishers and data providers to establish best practices in these areas and will report on progress regularly through our website and at industry events.

PLoS and its fellow alternative and new metrics advocates continue to expand the understanding of the value of metrics beyond

ALMs are also a powerful way to navigate and discover others' work based on real-time recommendation and collaborative filtering systems synchronized to the custom needs of each individual, whether you are a researcher, publisher, institutional decision-maker, or funder.

The uses of ALMs are limited only by our awareness of the insight they bring to the research artifact—the published article. In this nascent stage of implementation across publishers, we continue to build the conceptual and technical infrastructure for

data generation, display, and maintenance. PLoS continues to develop evaluation and collaboration tools for scientific communication, which incorporate ALMs as a fundamental part of their features in PLoS journals. The PLoS ALMs application is freely available as open source software for other publishers and platforms with similar technology infrastructures. And the application is available for the public to build third-party applications from it. PLoS also includes an API that makes this data available for anyone to re-use and mash-up. All

just usage data, establish such measures across all scholarly publications, and develop the supporting technologies. We have seen consistent, steady progress with our own ALMs implementation. The benefits of this system will be increasingly realized in equal measure to the degree of its adoption across the research ecosystem. 🌱