Trends and Innovations in Research Dissemination

Prepared by **Kathleen Shearer**

for the Canadian Association of Research Libraries





Trends and Innovations in Research Dissemination

Prepared by Kathleen Shearer for the Canadian Association of Research Libraries

April 2016

As with all aspects of research, new technologies are transforming the way research is disseminated. The traditional system, in which researchers publish their results in subscription-based academic journals (or monographs), still prevails, in large part due to the continued use of the impact and prestige factor of the publishing venue as a major assessment measure of research quality and impact. However, there are also numerous initiatives and projects that are challenging the conventional models. These activities are being driven by technologies, policies, and a more expansive notion of how research should be communicated.

This document presents some of the major trends and innovations in the area of scholarly communication as of early 2016, with an attempt to conceptualize them in the context of the scholarly communication lifecycle. Given that the environment is evolving quickly, up-dates to the framework are anticipated. The aim is to inform members of CARL and the broader community about new initiatives in this evolving environment. It describes 14 major trends in research dissemination and links to specific examples in each area.



• • • •

Trends

The initiatives identified through this review have been organized into 14 categories:

Access & Use

- 1. Text and data mining
- 2. Interlinking and contextualization
- 3. Content licensing
- 4. Purchasing and payment modes

Publish

- 5. Authoring and collaborative tools
- 6. Journal submission and selector tools
- 7. Peer review methods
- 8. Publishing platforms

Share

- 9. Data sharing
- 10. Repository and journal aggregators
- 11. Researcher social networks

Evaluate

- 12. Tracking research outputs
- 13. Impact measures
- 14. Journal quality assessment

Access & Use

1. Text and data mining

Text and data mining (TDM) derives new information from machine-readable material. It works by copying large quantities of material, extracting the data, and recombining it to identify patterns. Proponents of TDM assert that it will increase the progress of science exponentially and it is already being used in many domains for new discoveries.

- OpenMinTeD is creating an infrastructure that fosters and facilitates the use of text and data mining technologies in the scientific publications world and beyond, by both application domain users and text-mining experts.
- <u>Digging into Data</u> is an international project (with Canadian participation) that aims to address how 'big data' changes the research landscape for the humanities and social sciences. This project is developing new methods and techniques to mine the many types of databases of materials available for research in these disciplines.

2. Interlinking, commenting and contextualization

The emergence of web-based knowledge dissemination brings novel possibilities for enhancing the functionality of publications, datasets and other related material and employ techniques such as semantic enrichment, interlinking relevant material, and commenting, sharing, personalization and contextualization functionalities allowing users to navigate and find relevant content more efficiently and easily.

- <u>Hypethes.is</u> is building an open platform for discussion on the web. It leverages annotation to enable sentence-level critique or note-taking on top of news, blogs, scientific articles, books, terms of service, ballot initiatives, legislation and more.
- <u>Pubmed Commons</u> provides a forum for scientific discourse that is integrated with PubMed, a major database of citations to the biomedical literature. Any author of a publication in PubMed is eligible to join and post comments to any citation.

3. Innovations in content licensing

Libraries are leveraging their strength in numbers to simplify the process of license negotiation and use their power to create change to the system. The use of consortial licensing, the terms and conditions, and the ease in which they can be negotiated and implemented continue to evolve.

- Érudit Consortium and Canadian Research Knowledge Network (CRKN) have been exploring a partnership model, which involves support for a transition to open access and CRKN's involvement in the Érudit governance. With partnership commitments from the library community, Érudit plans to reduce the embargo moving wall to twelve months, with a long term plan to remove the embargo period entirely and become fully open access.
- Association of Dutch Universities (VSNU) has taken a strong stand in its licensing
 negotiations, stating that they are only prepared to renew subscription agreements
 if the publishers take steps towards open access. To date, they have reached deals
 with most of the major publishers that include the traditional subscription model
 plus open access to all Dutch publications, with no extra costs included in the
 licenses for the open access components.
- SCOAP³ is a partnership of thousands of libraries, funding agencies and research centers in more than 40 countries. They are working with leading publishers to convert 7 journals in the field of High-Energy Physics to open access at no cost for authors. SCOAP³ pays publishers centrally for the costs involved in providing open access, publishers in turn reduce subscription fees to all their customers, who can contribute to SCOAP³. Each country participates in a way commensurate to its scientific output in this field.
- Max Planck Proposal makes the case for a large-scale transformation of the current corpus of subscription journals to an open access business model using article processing charges.

4. Purchasing and payment modes

As open access gains in prevalence and there are growing requirements on researchers to ensure their publications are openly available, publishers and libraries are investigating new modes for supporting publishing that do not involve subscriptions.

- EDP Sciences is offering a new model where the author chooses their own fair price to publish an article in open access. The Liberty APC model means that authors can choose from a number of options for the level of an article processing charge (APC) they will pay to publish their article, which, in 2016 will be as low as no cost.
- A study on open access publishing cooperatives is being undertaken by the Public KnowledgeProject. The two-year initiative, in collaboration with the Scholarly Publishing and Academic Resources Coalition (SPARC) and other important stakeholders, will explore the feasibility of establishing publishing cooperatives that bring together libraries, journals, scholarly societies, presses, and others as a financially sustainable open access model for peer-reviewed scholarly publishing.

Publish

5. Authoring and collaborative tools

These are online, often cloud-based tools that support researchers in collaborating with others during the research process and when authoring publications. They are also used for the sharing of information, data and other research materials.

- Cos Open Science Framework offers Labs and teams across the globe a platform on which to work, share and provide access to their projects, data and publications with the research community. It also facilitates transparency of laboratory research and provides a network design that details and credits individual contributions for all aspects of the research process.
- <u>F1000 workspace</u> is a collaborative workspace for scientists to collect, write and discuss scientific literature.
- <u>Hivebench</u> is an easy-to-use lab notebook that helps researchers prepare, conduct and analyze experiments in one place.

6. Journal selector and submitter services

These are services that help authors prepare and submit articles to journals, ranging from support for language, editing and early peer review of articles to services that identify relevant journals in a given field.

- Edanz Editing is a service develops and delivers tools, materials, and training seminars and workshops to authors to assist non-native English speakers in authoring and editing their articles before submission to journals.
- Journal Author Name Estimator helps authors identify appropriate publishing venues for articles. It searches for articles that are most similar to submitted articles and then ranks associated journals.

7. Innovations in peer review

These projects are developing new forms of peer review and attempt to bring greater transparency to the peer review process for already published articles, pre-prints or other types of content.

- <u>PubPeer</u> allows researchers to comment on almost any scientific article published with a digital object identifier (DOI) or preprint in arXiv
- Episciences.org provides a technical platform for peer-review in order to support the adoption of open access electronic journals that publish articles posted in preprints archives such as arXiv or the national, open repository in France, called HAL.
- Open Peer Review Module for Institutional Repositories envisions the gradual conversion of existing open access repositories into fully-functional evaluation platforms that will provide the capacity needed to bring back research quality control to the community of scholars and help bridge the gap between academic institutions and publishers.
- The Winnower is an open access online scholarly publishing platform that employs open post-publication peer review. The aim is to revolutionize science by breaking down the barriers to scientific communication through cost-effective and transparent publishing for scholars.

8. Publishing platforms

These initiatives are developing new platforms that use technology to link related content, provide more efficient publishing services, and lower costs. They are also challenging the current system of publishing that relies so heavily on high impact journals.

- Frontiers is a community-rooted, open-access academic publisher that is using new technologies to make peer-review more efficient and transparent, provide impact metrics for articles and researchers, and has merged with a research network platform, Loop, to catalyse collaboration and research dissemination and popularize research with the public.
- OpenScienceLink is piloting a range of novel services that could alleviate the lack
 of structured data journals and associated data models, the weaknesses of the
 review process, the poor linking of scientific information, as well as the limitations
 of current research evaluation metrics and indicators.
- PLOS ONE is a multidisciplinary open access journal that accepts scientifically rigorous research, regardless of novelty. PLOS ONE features reports of original research from all disciplines within science and medicine in order to facilitate the discovery of connections between research whether within or between disciplines.
- Knowledge Unlatched is a new model that works with participating libraries from around the world to share payment of a single Title Fee to a publisher, in return for a book being made available on a Creative Commons licence via Open Access Publishing in European Networks (OAPEN) and HathiTrust as a fully downloadable PDF.
- Open Library of Humanities is a charitable organisation funded by an international consortium of libraries who have joined to make scholarly publishing fairer, more accessible, and rigorously preserved for the digital future.

Share

9. Data sharing

There is a trend towards improving the stewardship of data, and greater data sharing in the academic community. The trend is being driven by a growing recognition that research data are valuable assets that, if properly managed, have virtually limitless potential to be re-used in innovative ways. The proper management of research data is also an integral part of good research practice.

- <u>DataCITE</u> provides digital object identifiers for datasets that enable users to
 connect research publications to their underlying data, understand the use and
 impact of data, promote professional credit and rewards for creating and managing
 data collections, and promote scientific and data transparency.
- <u>Gigajournal</u> is an online open-access open-data journal that publishes 'big-data' studies from the entire spectrum of life and biomedical sciences.
- <u>Portage</u> is an initiative launched by CARL which coordinates and expands existing library-based expertise, services and infrastructure so that Canadian researchers have access to the support they need for research data management.

10. Repository and journal aggregators

Journal and repository aggregators aim to improve the discoverability and visibility of research outputs, with a focus on research articles. They also act as de facto communities of practice for data providers which help to define standards and best practices and ensure interoperability across participating communities.

- OpenAIRE is a technical infrastructure that pulls together and interconnects the large-scale collections of open access research outputs across Europe. The project creates workflows and services on top of this repository content, which will enable an interoperable network of repositories (via the adoption of common guidelines), and easy upload into an all-purpose metadata repository.
- LA Referencia maintains a centralized platform that harvests metadata from 8 national nodes in Latin America aggregating from about 200 repositories, and representing over 800,000 full-text open access documents including journal articles, theses and dissertations, and research reports.
- <u>Érudit</u> offers a centralized access to the majority of francophone publications in the social sciences and humanities from North America, including scholarly and cultural journals, books, conference proceedings, theses and dissertations, as well as various research documents and data.
- <u>Paperity</u> is the first free, multidisciplinary aggregator of "gold" and "hybrid" open access journals and papers from the Sciences, Technology, Medicine, Social Sciences, and Humanities and Arts with the goal of aggregating 100% of open access literature, published in any place around the world, in any field of research.
- <u>DeepDyve</u> provides access to over 12 million articles from 10,000 peer-reviewed journals of the world's leading publishers including Reed Elsevier, Springer, Wiley-Blackwell for \$40 per month.

11. Researcher social networks

Large academic social networks have become very popular over the last several years. These networks are used by researchers to follow discussions in their field, discover potential collaborators, and also post and share research articles and other work.

- ResearchGate has 7 million researchers from around the world registered with over 80 million publications available to members.
- Academia.edu is a platform for academics to share their research, monitor the impact of their research through various measures and track the research of other academics they follow. There are over 24 million academics that have signed up to Academia.edu, sharing over 6 million papers with over 36 million unique visitors a month.
- <u>Mendeley</u>, recently purchased by Elsevier, is a free service that acts as a reference manager and academic social network. It supports connections between academics and preparing research articles for publication.

Evaluate

12. Tracking research outputs

Funders and institutions are interested in better monitoring the research outputs produced by their affiliated researchers. There are a number of services available to support better tracking of research outputs. These services rely heavily on the use of identifiers, such as ORCID IDs, FundRef and institutional identifiers.

Examples:

- SHARE is a US-based project building a free, open, data set about research and scholarly activities across their life cycle. SHARE collects, connects, and enhances scholarly metadata—from data management plans and grant proposals to preprints, journal articles, and data repository deposits—so they can be identified as elements of a single research project.
- OpenAIRE allows research funders and institutions to better track their research outputs. It is similar to SHARE, but is more mature. See more information about OpenAIRE in the "repository and journal aggregator" section.
- <u>CHORUS</u>, or Clearinghouse for the Open Research of the United States, is a service that identifies open access articles for funders in order to help them track adherence to their open access mandates and policies.
- <u>Science 1</u> is a Canadian company that offers a fee-based service to track all open access papers published by faculty in peer-reviewed journals wherever they are archived. Users can easily discover and download these papers and their metadata from the host site, consistently and with one click.

13. Impact measures

Going beyond citations, there are other indicators that reflect the impact of research and provide a more holistic picture of the usefulness and impact of a scholar's work. There are a number of projects that are developing and implementing new measures such as article views and downloads, tweets, newspaper articles, adaptations, discussions on research blogs, number of collaborators, and so on.

Examples:

- <u>Impactstory</u> is an open-source, web-based tool that helps scientists explore and share the diverse impacts of all their research products—from traditional ones like journal articles, to emerging products like blog posts, datasets, and software.
- <u>PlumX Metrics</u> allows users to get more value from an institutional repository (IR) by embedding the metrics about their research directly into the IR. These metrics consider different versions of the same article—not just the one in the IR—so that authors can see the impact and reach of their research beyond just the individual repository.
- A Times for Higher Education article talks about new measures that look at how the process of research will help make the use of metrics to assess performance more responsible. For example, how individuals contribute to the "overall research endeavour" through their involvement with peer review, the running of learned societies, and sharing data.

14. Journal quality assessment

Changing publishing models, including the rise of open access journals, have reshaped the ways in which scholars share and use journal articles. More than ever, understanding the criteria for assessing journal quality is critical in determining the overall value of any publication.

. . . .

- Think, check, submit is a new industry-wide initiative that provides a checklist of quality indicators that can help researchers identify if a journal is a trustworthy place to submit their research.
- Beall's list of predatory journals is a list of questionable, scholarly open-access publishers that is maintained by a librarian in the United States.

