How changing technical and social landscapes are affecting scientific discovery ~~and applied research~~

Barbie Keiser
bkeiser1@jhu.edu
barbie.keiser@gmail.com

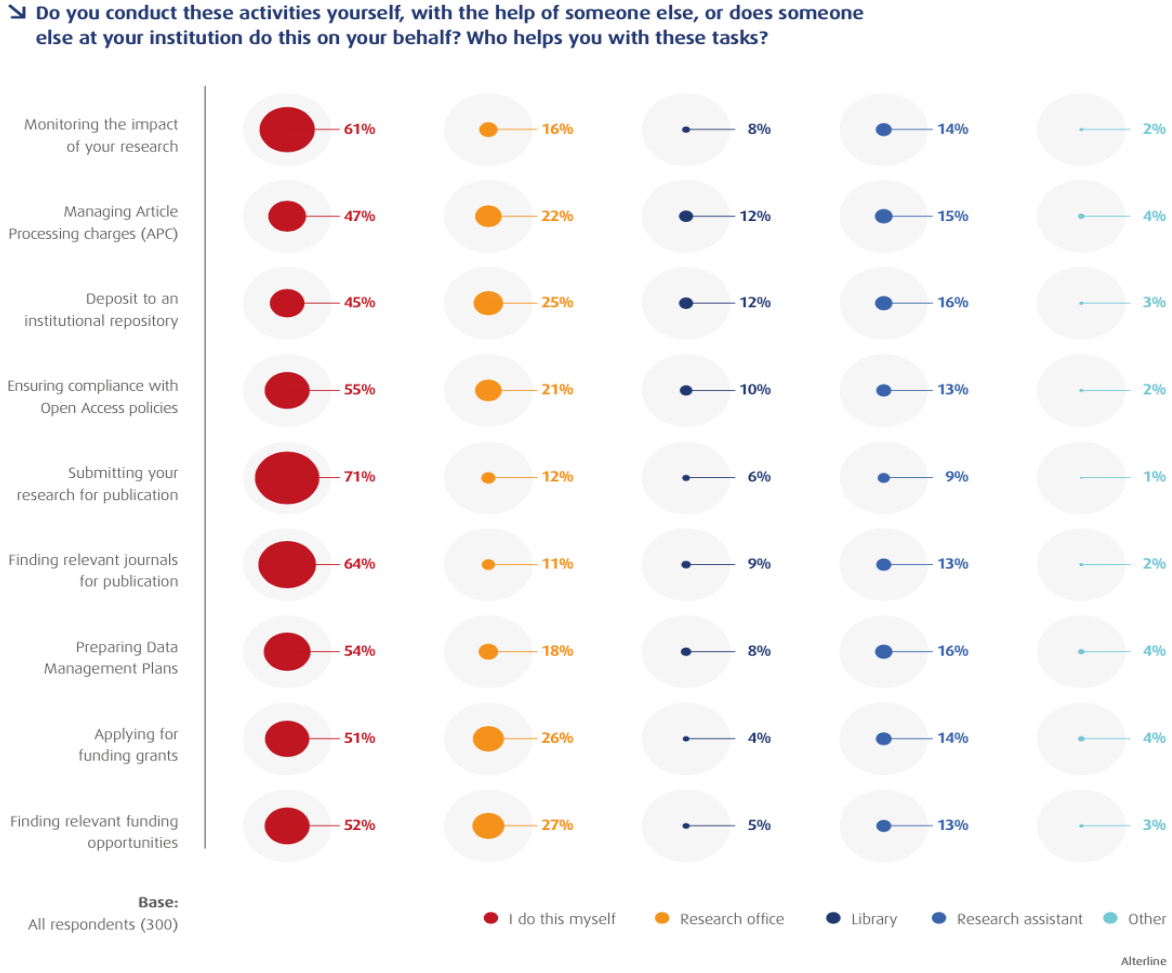
MLW2019
Arlington, VA

Alterline report conducted for Ex-Libris

Supporting Academic Research

Understanding the challenges

Findings from a 2019 study of 300 researchers in the US, the UK, and Australia.



Alterline

A changing ecosystem

The library/information professionals

New tools, new approaches

How we learn & how/what we teach

Influences & Impacts, criteria & metrics

Figure 1: Research Life Cycle (University of California, Irvine, Libraries, Digital Scholarship Services, 2019). Reprinted with permission of the UCI Libraries.

~~The library~~ information professionals

Improving discovery and dissemination of scientific research

- Browsers & search engines, monitors & alerts
  - Semantic Scholar
  - Biocarian.com & socialscienceresearch.com
  - DataMed.org's bioCADDIE
  - Peer.us
  - CHORUSaccess.org
- Globalization + title, database, & publisher acquisitions
  - Publisher, platform, community expansion

Librarians as stewards

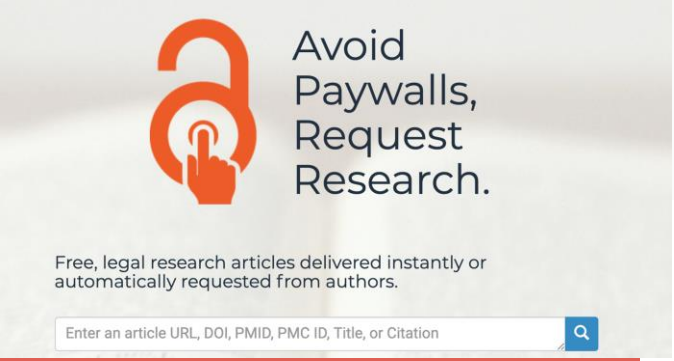
- Self-archiving (ShareYourPaper.org)
- Data retention requirements
  - Reproducibility
  - Making data available for reuse
  - Perma.cc

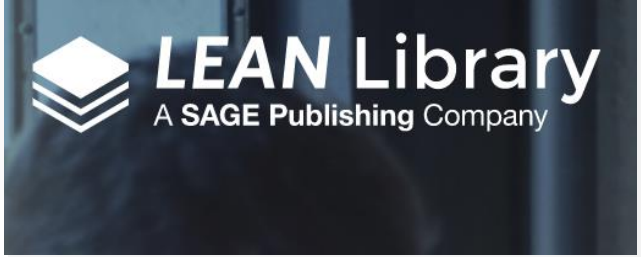
Understanding the modern scholarly communication system

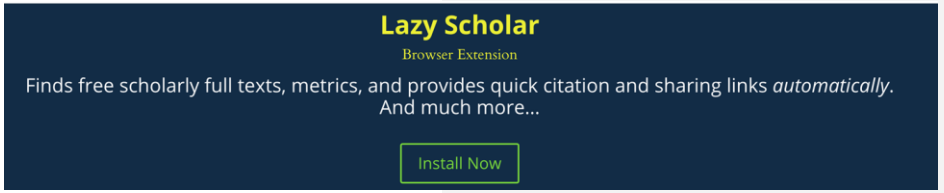
- Preprints & working papers
  - Assert.pub
  - F1000
  - PCA-News.com
  - https://osf.io/preprints/
- PaaS
- Institutional repositories

Barrier busters, integrity inspectors, and collaboration tools

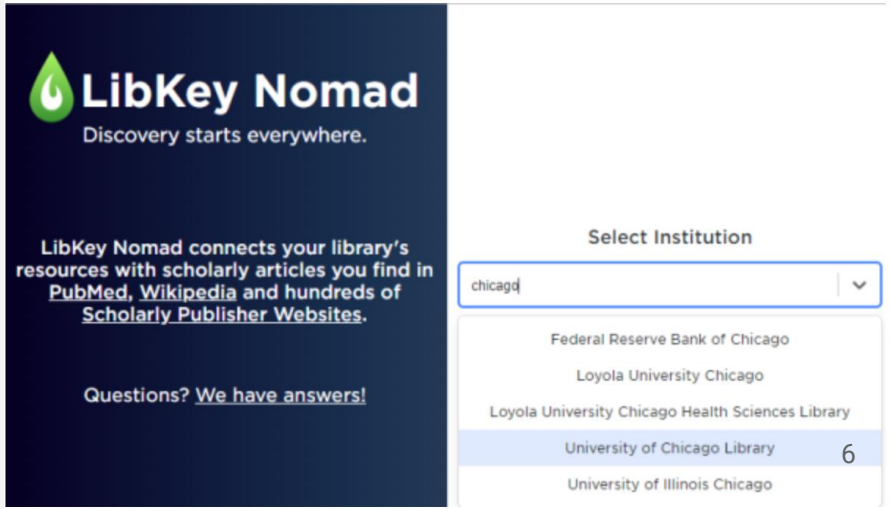
- Access broker browser extensions
- Science institutions hiring integrity inspectors to vet their papers (Nature)
- Massively Open Online Papers (MOOPs)





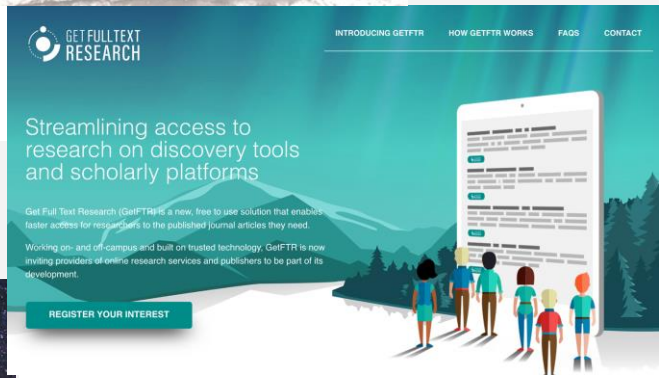


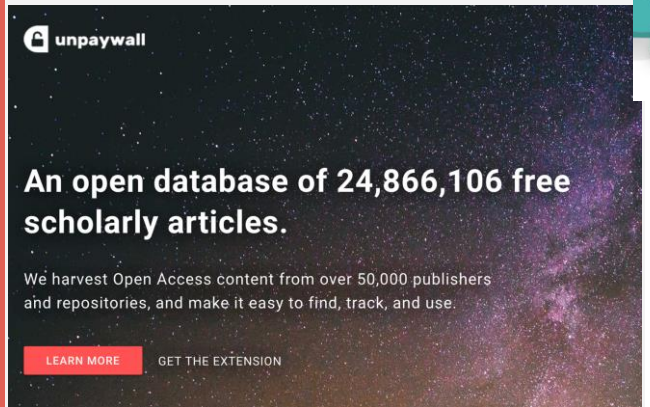
Access Broker Browser Extensions

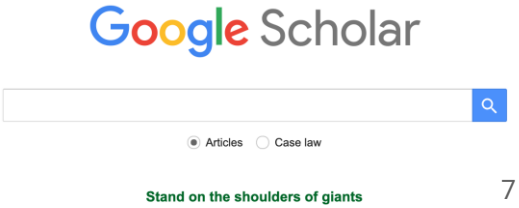


Barrier Busters

Shareyourpaper.org by Open Access Button







Blockchain

BLOCKCHAIN edited by Sandra Hirsh and Susan Alman. ALA Center for the Future of Libraries, 2020

Recording changes made to an item on a blockchain could make its authenticity simple to verify

- ❏ Application potential for archives and records management
- ❏ Research data curation

Metadata about information resources

Blockchain platforms could support new, distributed, large-scale metadata systems

Blockchain-based financial systems could be used to purchase scholarly resources

Scholarly publishing workflows

- ❏ Artifacts.io
- ❏ Orvium.io
- ❏ Protocols.io

Credentialing and CE

New tools, new approaches

Determining where to publish + initial steps

- ❑ OA/OS/OR (XXXArXiv)/OER
  - ❑ ~~Patents, clinical trials, courts~~
- ❑ Plan S
- ❑ Editage + its partnerships
- ❑ Peerwith.com
- ❑ International Science Editing (internationalscienceediting.com)
- ❑ JournalGuide.com & aje.com from Research Square
- ❑ Creating two abstracts at the outset
- ❑ Selecting keywords

Tools of note

- ❑ CORE.ac.uk
- ❑ J-Stage (GLOALL/Japan)
- ❑ Force11.org
- ❑ Scienceopen.com
- ❑ OpenScienceMOOC.eu (Eliademy.com)
- ❑ Health Research Alliance open science platform launched in partnership with the National Library of Medicine (Figshare)

Successfully navigating the peer review process for journals and conferences

- ❑ Publishers (Hindawi) are trying alternatives (open annotation)
- ❑ SciRev.org + PEERE.org + F1000
- ❑ Scholasticahq.com + PUBLONS
- ❑ Rubriq.com from Research Square
- ❑ BiomedCentral + *Open Biology*
- ❑ Clarivate's ScholarOne
- ❑ Peerageofscience.org

Managing post-publication

- ❑ Press releases (content + placement)
- ❑ Infographics, animations, video
- ❑ Reviewers
- ❑ Dealing with IP rights
- ❑ Social/communities

Open Science is …

Open to participation

- No barriers based on race, gender, income, status, language
- Involvement of societal partners in research priority setting
- Evaluations that include societal relevance
- Citizen science
- Broadly considering all knowledge (including local knowledge)
- Error-friendly culture

Open to (re)use

- Open Access, for people and machines, to:
  - Proposals and applications
  - Data
  - Code
  - Posters and presentations
  - Preprints, working papers
  - Papers and books
  - Reviews and comments
- Open, non-proprietary standards
- Open licences
- Full documentation of process, including negative results

Open to the world

- Translations
- Plain language explanations
- Outreach beyond academia
- Open to questions from outside academia
- Curation and annotation of non-scholarly information
- Participation in public debate

and: Open educational resources / Open source software / Open hardware / (no) patents

DOI: 10.5281/zenodo.3352631

see also: Bosman & Kramer (2017) Defining open science definitions

How we learn & how/what we teach

Research guides

- ❑ Citation management+
  - ❑ ReadCube Connect
  - ❑ Colwiz.com
  - ❑ CrossMark for Researchers
- ❑ Lit reviews
- ❑ Self-archiving
- ❑ E-lab notebooks

Targeted workshops, drop-ins & meetups

- ❑ Partnerships & collaboration
- ❑ Faculty-specific
- ❑ Interdisciplinary
- ❑ Beyond your institution
- ❑ “How to” deposit work in the institution’s repository

Subjects covered

- ❑ R/Python
- ❑ Data visualization (Tableau)
- ❑ Digital mapping/Geomapping
- ❑ Web authoring/publishing tools
- ❑ Digital annotation tools
- ❑ Storytelling
- ❑ Text/data mining (NLP, ML)
- ❑ http://guides.lib.uw.edu/bothell/digitalscholarship/tools

Linking truth to evidence

“Fake” applies to science too

What happens when a scientific field experiences hyper-competitiveness?

- ❏ Unsubstantiated or erroneous claims can have serious repercussions
- ❏ Non-specific language can contribute to confusion, or worse
- ❏ Technical language (jargon, acronyms) can impede understanding of complex issues

Exaggerations to make a point, or purposely inflating/deflating numbers, can lead to poor decisions

- ❏ “The urge to set trending topics in order to gain viral popularity and thus attention leads to an exaggeration or simplification of results.” (ALLEA)
- ❏ Pseudoscience or “junk science” is rampant on social media

- ❏ Information presented to compel or dissuade people from action can thwart true intent

- ❏ Dubious methodologies for data collection in an age of increasing privacy, compounded by complex analysis techniques and confusing presentation of statistical data, often for the sake of a “cool” visualization

- ❏ Resource to help journalists assess the newsworthiness of scientific findings and evaluate methodologies from the Shorenstein Center on Media, Politics and Public Policy resource https://journalistsresource.org/tip-sheets/research/medical-studies-newsworthy-research-tips/
  - ❏ Journalistsresource.org
  - ❏ Toolsforreporters.com
- ❏ Sciencefeedback.co
- ❏ Retractionwatch.com

Influences & impacts, criteria & metrics (Scholarly Kitchen blog)

Individual publication/scientist/institution

- ❑ Alternative metrics (Altmetrics)
  - ❑ Depsy.org
  - ❑ www.metrics-toolkit.org
  - ❑ Proposal for a standard article metrics dashboard to replace Journal Impact Factor, 07/2019
- ❑ Scientist/scholar (Kudos)
  - ❑ Bibliometric thresholds
- ❑ Acquisition of assessment and analytic tools
- ❑ DORA (sfdora.org)
- ❑ Analytics for libraries+

Today's tools allow publishers to offer real-time/instantaneous feedback at the article level

- ❑ Total documents, total cites, cites/doc, references/doc
- ❑ H-index and g-index quantifying the impact of an individual offer
- ❑ Eigenfactor.org metrics scoring Article Influence and Journal Prices within a field (+5-year citation data)
- ❑ JIF via Clarivate Citation Reports
- ❑ SCImago Journal and Country rank
- ❑ Impact Vizor from Highwire Press
- ❑ Scopus (Elsevier) journal metrics
  - ❑ Impact per publication
  - ❑ SNIP

Societal impact

- ❑ Policymaking
- ❑ FastTrackimpact.com
- ❑ ResearchFish.net
- ❑ Becker (Medical Library) Model (WUSTL)

Tools

- ❑ Citation management
  - ❑ Scite.ai
- ❑ RIM as the faculty portfolio
  - ❑ Elsevier's PURE
  - ❑ Digital-Science Symplectic

Grants

How science got funded in the past

- ❏ National boundaries
- ❏ Domain-specific

What gets funded/how

- ❏ No boundaries
- ❏ Collaborative efforts
- ❏ *Grant writing guides/workshops*

Research tools we used to identify potential funders/funding agencies

- ❏ Big Book
- ❏ Directories of Research Grants
- ❏ Foundation Directory
- ❏ NSF
- ❏ Grants.gov
- ❏ CrossRef's Funding Data service (crossref.org/funding data)
- ❏ SHARE Initiative (share-research.org)

Strategic use of social platforms as communities

- ❏ LinkedIn, Academia.edu, ResearchGate.net,F1000, ScholarlyHub.org
- ❏ Vivoweb.org (DuraSpace), Direct2Experts

Data

Finding & presenting data

- ❏ FAIR Principles apply to repositories
  - ❏ DataCite, CrossRef, i4OC
- ❏ The right graphic
- ❏ Communicating science through comics & animation (sciani.com)
- ❏ Infographics, the scientific poster (osf.io), video (Research Square)
- ❏ Using timelines and maps to tell a story (timeline.knightlab.com)

What we know/contribute

- ❏ Managing, archiving, preserving
- ❏ Data management planning
  - ❏ Needs assessments
- ❏ Data/metadata standards
- ❏ Data service providers/services
- ❏ Repository services
- ❏ Data management research guides/workshops/blogs...

Research data management (RDM)

- ❏ Tools for data cleaning & transforming, exploring & extending
- ❏ Ensuring that data is secure, backed-up
- ❏ Repository services (short- & long-term storage)
- ❏ Providing/controlling access
- ❏ Communities and learning opportunities
  - ❏ Simmons Research Data Management Library Academy (RDMLA)
  - ❏ LibraryCarpentry.org

Linking datasets in perpetuity

Privacy and confidentiality issues

Publications, platforms, & online mentions+

Scientific publishing & the ability to share

- ❑ Number of scientific journals
- ❑ Acquisition of titles
- ❑ Learned societies
- ❑ Open access (OA)
  - ❑ Faculty-specific
  - ❑ Library as publisher
- ❑ Howcanishareit.com

Platforms designed for data sharing & analysis

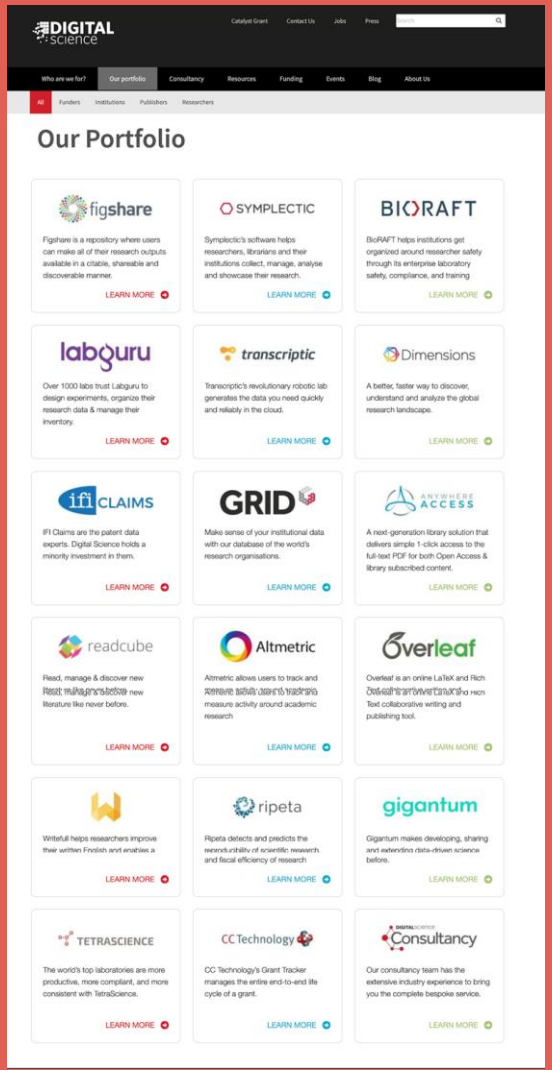
- ❑ Citations, including in policy documents
- ❑ Data.Mendeley.com
- ❑ SciCrunch.org (University of California, San Diego)
- ❑ Dimensions.ai in Digital-science.com
- ❑ Synapse.org

Social platforms and tracking tools

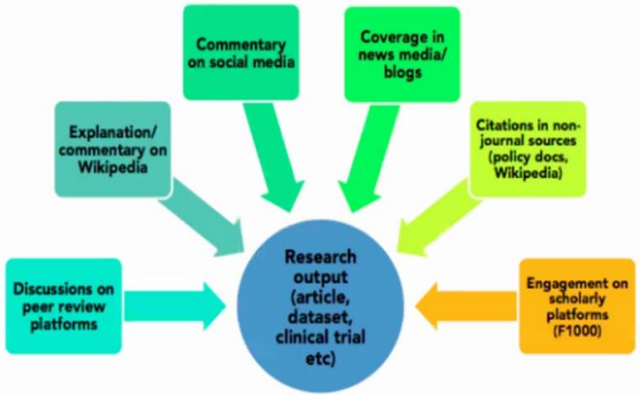
- ❑ Web.mention.com
- ❑ Kudos
- ❑ Impactstory.org tracks “buzz” on Twitter
- ❑ PLOS software tracks how many times an article is shared using social networking tools

Aggregation & Analysis

- ❑ Contributing to the discussion
- ❑ Policy documents



Digital Science has helped develop new metrics



ONLINE Searcher articles on the subjects discussed in this presentation

“Conveying the meaning behind the data,” May/June 2016, pp. 20-24, 41

“Innovations in scholarly publishing,” January/February 2017, pp. 16-22

“Scholarly hiccups beyond the ‘publish or perish’ debate, July/August 2017, pp. 22-23, 40-45

“In support of the scholar,” March/April 2018, pp. 16-21,38-39

“Trends in scholarly publishing,” March/April 2019, pp. 22-27

“Librarians assisting scholarly publishing: websites to watch,” May/June 2019, pp. 16-21

"Supporting Libraries, Scholarship, and Publishing in the Global South,” Jan/Feb 2020 (forthcoming)

Questions?

Thanks to you for coming and participating

If you come across any good resources, do let me know!