

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

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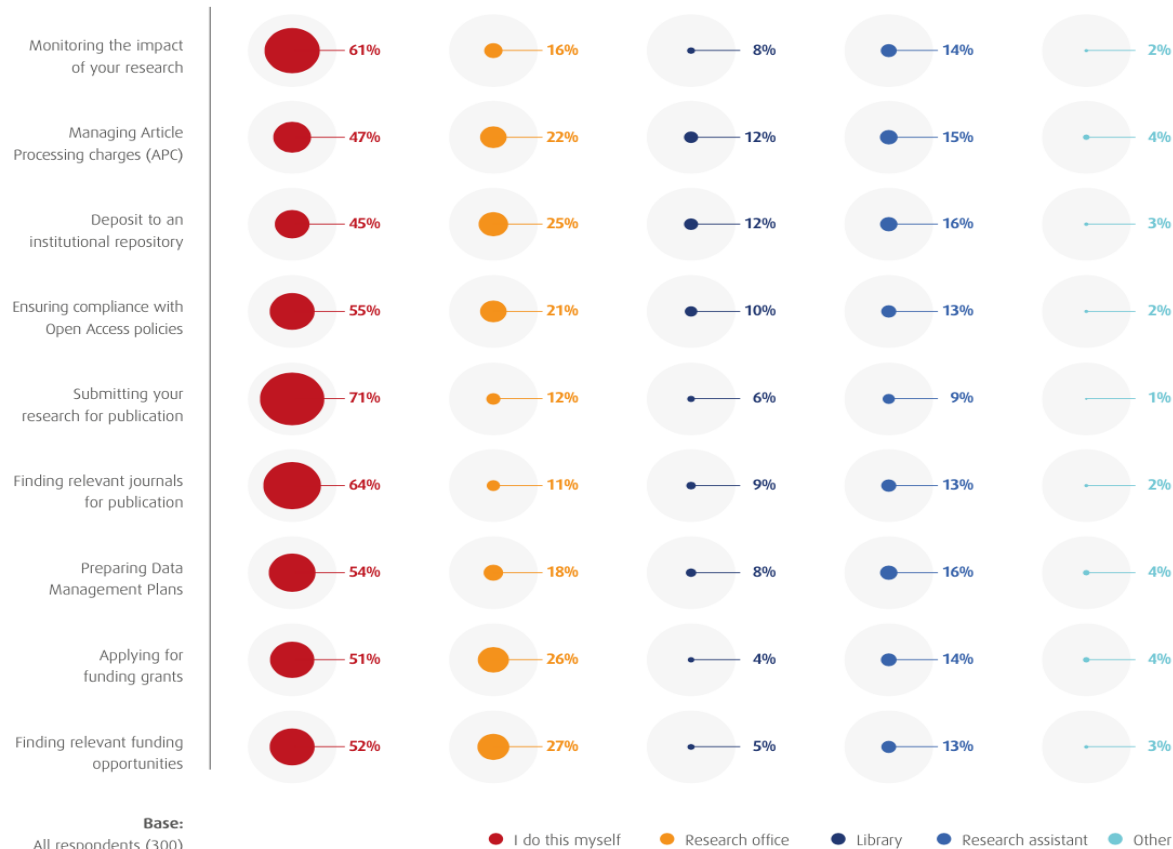
MLW2019
Arlington, VA

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.

➤ Do you conduct these activities yourself, with the help of someone else, or does someone else at your institution do this on your behalf? Who helps you with these tasks?



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)



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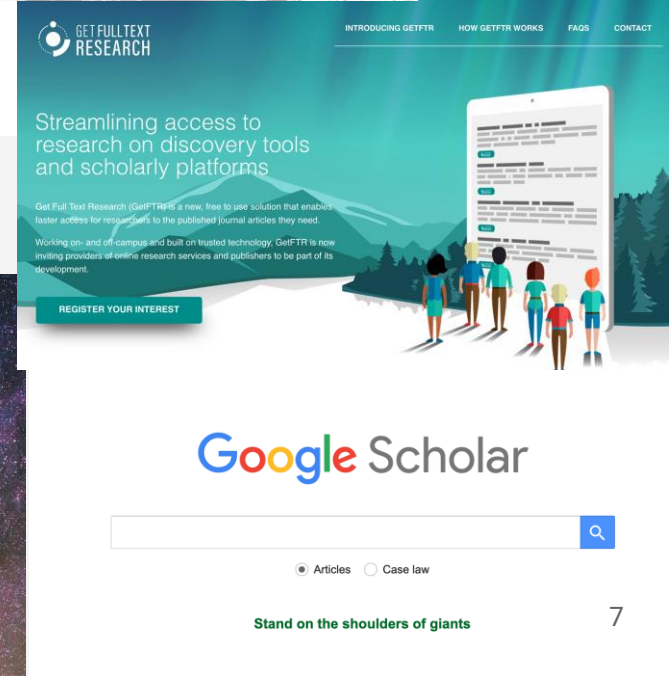
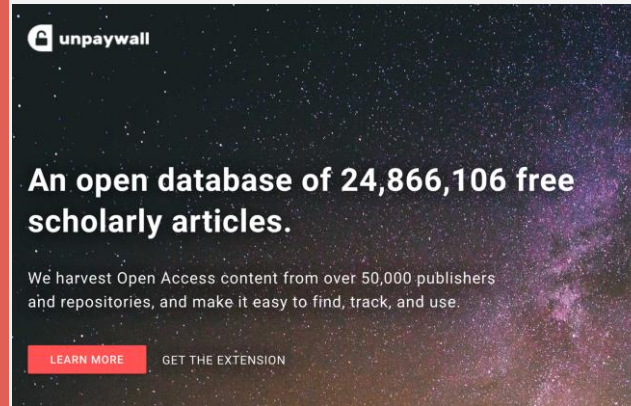
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University of Illinois Chicago

Barrier Busters



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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

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

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)

Managing post-publication

- ☐ Press releases **s** (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

see also: [Bosman & Kramer \(2017\) Defining open science definitions](https://doi.org/10.5281/zenodo.3352631)



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](https://journalistsresource.org)
 - ❑ [Toolsforreporters.com](https://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+

Societal impact

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

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

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, i40C
- ☐ 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

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

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

Aggregation & Analysis

- ☐ Contributing to the discussion
- ☐ Policy documents

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Our Portfolio

Figshare is a repository where users can make all of their research outputs available in a citable, shareable and discoverable manner.

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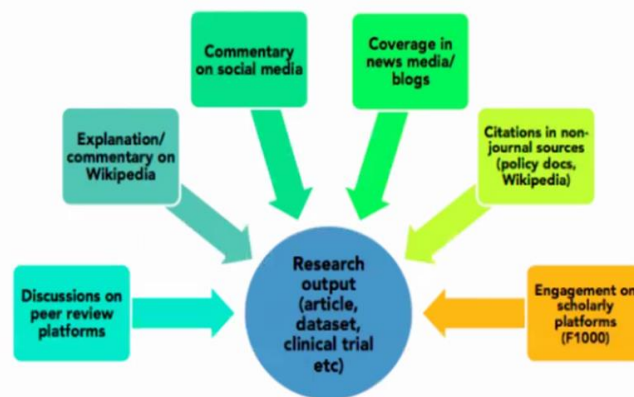
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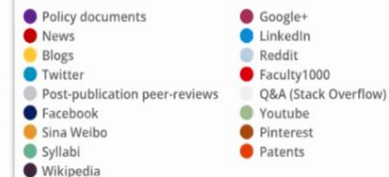
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Digital Science has helped develop new metrics



The Colors of the Donut



Single-step method of RNA isolation by acid guanidinium thiocyanate-phenol-chloroform extraction

Piotr Chomczynski, Nicoletta Sacchi
1987, Analytical Biochemistry - Article

Citations: 51k X 1776.21 Altmetric: 46 Add to Library

A short history of SHELX

G.M. Sheldrick
2008, Acta Crystallographica Section A: Fourier

Citations: 64k X 1627.23 Altmetric: 65 Add to Library

STATISTICAL METHODS FOR ASSESSING THE RELIABILITY OF CLINICAL MEASUREMENT

J. Martin Bland, Douglas G. Altman
1986, The Lancet - Article

Citations: 31k X 1616.42 Altmetric: 79 Open Access Add to Library



**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!**