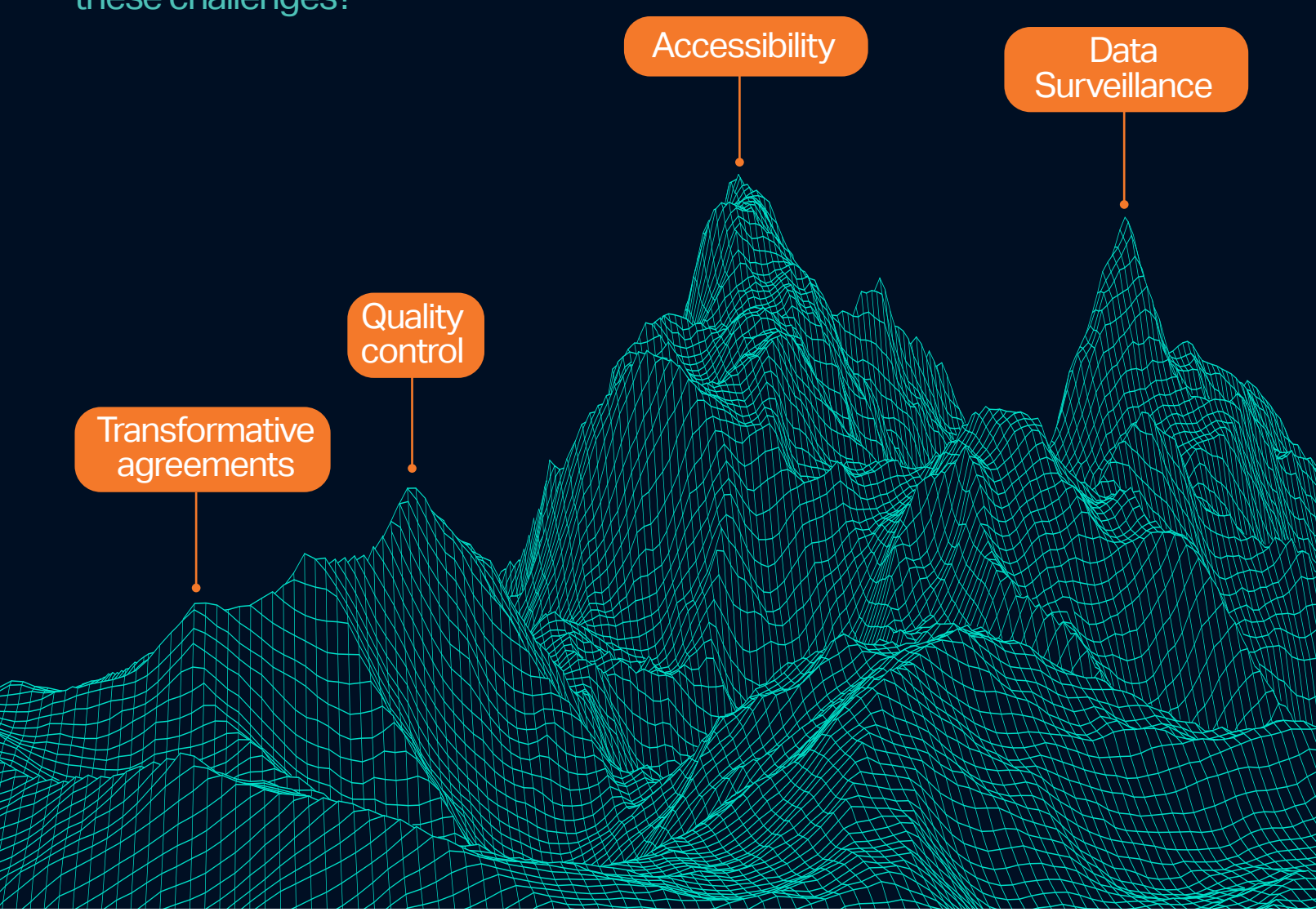
Research information Yearbook 2022/2023

The definitive guide to the scholarly research environment

OA's shifting landscape

Is 2023 the year open can conquer these challenges?



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New models of publishing: Libraries as publishers

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KEY TAKEAWAYS

- An insight into the scholarly publishing landscape
- Hear about the latest technologies and new models of publishing that can support the needs of the scholarly community
- Learn about best practices and shared expertise in library publishing

SPEAKERS

Simon Bains
University Librarian, University of Aberdeen

Tracey Stanley
Director of Library Services and University Librarian at Cardiff University

Megan Taylor
Director of Content and Research, The International Bunch

Emma Molls
President, Library Publishing Coalition

The value of transformative agreements

With ever-tighter budgets, how do institutions decide whether transformative/read-and -publish agreements represent good value? If they do make the decision, what are the implications for librarians?

KEY TAKEAWAYS

- A breakdown of the impact of transformative agreements on libraries
- Insights into programmes that can help libraries implement transformative agreements
- Funding considerations and the value transformative agreements can provide

SPEAKERS

Jayne Marks
Maverick Publishing Specialists

Helen Dobson
Licensing Portfolio Specialist, Jisc

Yvonne Nobis
Head of Physical Sciences Libraries, University of Cambridge

Conforming to the REF: An international view

The REF is a UK-specific measure for research institutions to assess the quality of their research output and is pertinent to libraries, research offices, university planning departments and institutions. But this webcast will aim to look at this within a global context and explore other frameworks that are in place around the world.

KEY TAKEAWAYS

- Learn how the outputs of scholarly research are evaluated globally
- Hear from experts about best practices in the assessment of researchers and scholarly research
- Key insights into why representation of researchers in the design of research assessment practices across the world is crucial

SPEAKERS

Jonathan Adams
Chief Scientist at Institute for Scientific Information

Vinciane Gaillard
Deputy Director for Research and Innovation at European University Association

Stephen Curry
Chair of The Declaration on Research Assessment (DORA) steering committee
President, Library Publishing Coalition

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Research Information is published by Europa Science Ltd, 4 Signet Court, Cambridge, CB5 8LA • ISSN 1744-8026
Tel: +44 (0) 1223 211170 • Fax: +44 (0) 1223 213385
Web: www.researchinformation.info

Subscriptions: Free registrations available to qualifying individuals – register online at www.researchinformation.info
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Mysciencework

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Open Access keeps me up at night. Not the why…or the what, but the how, writes Sara Bosshart

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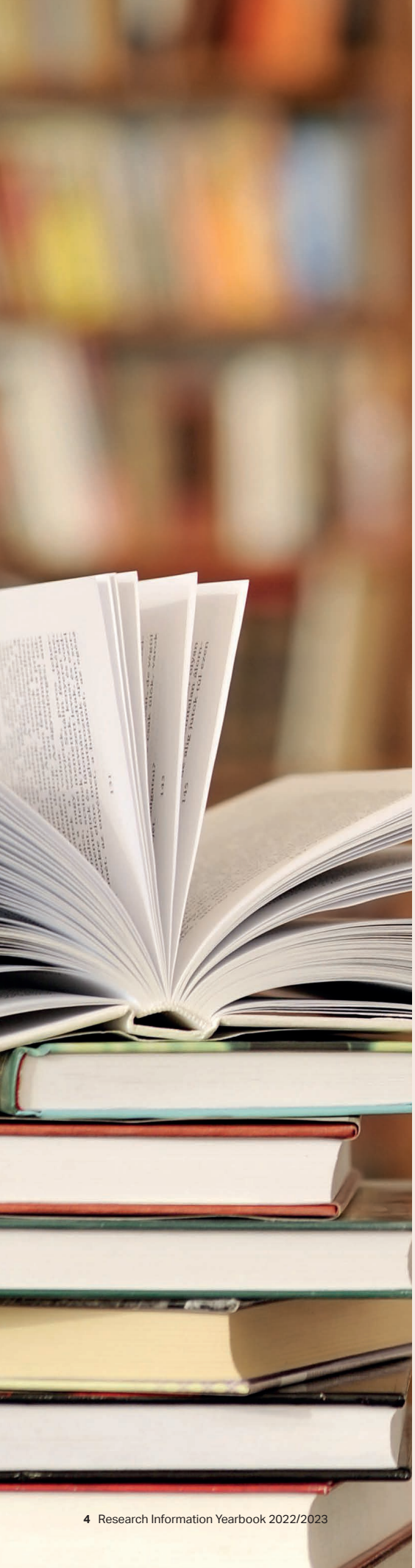

Navigating the shifting landscape of scholarly publishing

The landscape of scholarly publishing is constantly changing, with new technologies and business models emerging every day. These advances in technology and the transformation of traditional agreements between publishers and libraries has led to a rise in open access publishing – a way to make research freely available to anyone with an internet connection. But how do we navigate these changes? In this edition of the Research Information Yearbook, we will explore what open access publishing is, how it works, and the implications for academics, publishers and librarians in 2022 and what that will look like in 2023 and beyond.

As we know, open access (OA) publishing refers to scholarly journal articles that are made available online for anyone to read or download without subscription fees or paywalls. This differs from traditional academic publishing, which requires readers to pay a fee in order to access content.

Open access works by allowing authors to retain the copyright on their work while granting publishers permission (usually under Creative Commons licence) to distribute it freely online. This enables authors to receive recognition for their work while also making sure that it reaches as many people as possible. Publishers can then monetise the content through other means, such as advertising or sponsorships, instead of charging readers directly for access. In addition, some publishers may also charge article processing fees (APCs) when an article is accepted for publication in order to cover costs associated with peer-reviewing, editing, formatting, and hosting the article on their platform.

The emergence of open access has had profound implications for all those involved in scholarly publishing — from researchers and librarians who have easier access to research materials; to publishers who are now able to generate revenue through alternative sources; and even academics who can now

disseminate their work more widely than ever before.

However, there are also downsides. For example, it has been argued that open access could lead to lower quality control due its reliance on author fees or donations instead of traditional subscription fees. Furthermore, some argue that OA could be used by big companies or governments as a tool for censorship if they were allowed unrestricted control over content distribution online.

The introduction of open access has revolutionised the world of scholarly publishing by making research more widely accessible than ever before, but it has also presented some challenges that must be addressed if we are going to ensure its success into the future. How these issues will be resolved remains uncertain – but one thing is certain: navigating this shifting landscape will require careful consideration from all stakeholders involved in scholarly publishing – academics, publishers and librarians alike.

Annabel Ola
Managing Editor
Research Information

TRANSFORMATIVE AGREEMENTS: MAKING UNIVERSAL ACCESS TO RESEARCH A REALITY

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It's not if, but how – open access is the future of scholarly publishing, yet the debate on how to accelerate its growth continues, writes **Julian Wilson**

IOP Publishing has been an open access (OA) publisher for more than 20 years. We recognise the incredible value and impact of scientific research and believe that wider and faster access to this trusted source of knowledge is key to advancing scientific discovery.

Our data tells us that OA content is downloaded 80% more than paywalled content and cited 30% more. We know that publishing on an OA basis significantly increases research visibility, but that doesn't mean we can rush headfirst into a fully open world. A careful approach is needed to ensure that the transition to OA is fair for all researchers, irrespective of where they are based geographically, their subject area or the funding support they receive. At the same time, the transition needs to consider the costs necessary to produce, protect and preserve the quality of peer review and publication upon which excellent research relies.

Researcher perceptions and OA progress

The support from researchers for an open future is there. Recent research that we carried out with other physics societies shows that over half (53%) of physical science researchers want to publish their work OA and reap the benefits of unrestricted access to research.

When respondents were asked why they favour OA publishing, agreeing with its principles and benefitting from a wider readership were cited as the top two reasons. But that same research also tells us that 62% have been prevented from doing so because they have not been able to access the necessary monies from funding agencies to cover the cost. The lack of funding is most keenly felt by researchers in South, Central and Latin America, as well as in India and Pakistan, where approximately 80% of respondents specified a lack of funds as the main reason for not publishing OA. More than 3,000 physical science researchers from →

across the globe participated in the research between December 2021 and January 2022.

Great strides have already been made in OA. The physics community is no stranger to open science practice. Early sharing of preprints via arXiv was first established more than 30 years ago, while there has been 25% annual growth in OA articles in the physical sciences over the past decade. This compares with an overall average annual growth in physics articles of about 2%. Over the past few years, publishers have been significantly increasing OA publishing options for our authors. New OA journals have been introduced, the sharing of open data encouraged, and the number of transformative agreements has continued to grow. These agreements have proven highly effective to accelerate the transition to OA.

The power of transformative agreements

Transformative agreements (TAs) make OA publication by authors in participating institutions as simple as possible. They are contracts between publishers and universities that fold the cost of publishing (article publication charges, or APCs) into subscription contracts and comply with various OA funder mandates. In short, they enable researchers to publish their research OA at no cost to them as the fees and admin are covered by their institutions.

According to figures from the ESAC initiative, there has been a 60% year-on-year increase in TAs since 2014, when they first started recording the deals. They have been gaining momentum in Europe for several years and are now appearing in the US, Latin America, Canada, Australia and elsewhere.

IOP Publishing has transformative agreements with more than 300 institutions in 17 countries. No two agreements are exactly the same, as member institutions are diverse and have different sets of requirements. The number of years the agreement is in place can vary from one to three years, the types of journals included can differ, some have limits on the number of OA articles, others are uncapped. Our starting principle is to offer unlimited agreements to stimulate the greatest uptake. We see them as the most effective shift to a more open future at scale.

"Concern remains that researchers from less wealthy countries could find themselves locked out"

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Unlimited open access publishing

Unlimited transformative agreements provide a simple and transparent framework to accelerate the move to OA in a way that is sustainable for both libraries and publishers. With caps removed, it is possible for all of an eligible author's articles to be published OA. This means less administrative burden for librarians, with centralised payment and no need to worry about additional costs should authors publish more than anticipated.

Unlimited TAs also provide greater author choice, making them more able to publish in the journal most suitable for their research. To make OA publishing under transformative agreements even easier, IOP Publishing now includes both hybrid and fully gold OA titles in our agreements and we have introduced a journal finder tool to make it simple to check if the journal an author has chosen complies with their funder or institutional requirements.

For transformative agreements to deliver on their promise of enabling OA at scale, they must deliver on the basic notion of transformation. If the number of articles included in the agreement is limited, it stands to reason that the transition to full and immediate OA at scale will not be achieved.

Reducing global inequalities

The concern remains that researchers from less wealthy countries could find themselves locked out of being able to publish OA. Many contracts remain too costly for institutions in lower- and lower-middle-income economies, creating inequalities for their affiliated authors. Further solutions are needed to ensure that OA does not create a greater divide between those who can pay, and those who can't. All authors should have the opportunity to publish their work, and the work published should represent the diversity of the global science community.

We are proactively working on ways to address the challenges. We have recently renewed our agreement with the Electronic Information for Libraries consortium – which represents mainly lower-middle-income economies - to provide free or discounted access to our content for affiliated libraries and library consortia. In addition, our APC discount and waiver programme for low- and lower-middle-income economies means researchers from low-income countries can publish OA for free in any of our fully OA or hybrid journals. Researchers from lower-middle-income economies can publish OA for a flat charge of £500.

Scientific publishing is a global enterprise, as is scientific research itself. Transformative agreements need to be adopted globally to truly succeed. OA positions, policies and funding vary considerably between countries, and conversations and policies need to be developed with funders, institutions, publishers and researchers themselves. For OA to have the biggest impact in driving true scientific progress, its complexities and challenges across the globe must be fully understood. It will take time, but it will be worth the effort to make OA the default choice.

***Julian Wilson**, Sales and Marketing Director at IOP Publishing*

[1]Data sourced from Dimensions, an inter-linked research information system provided by Digital Science. www.dimensions.ai

OPEN ACCESS IN SCHOLARLY PUBLISHING: WHERE ARE WE NOW?

Thomas Shaw and Andrew Barker from Lancaster University Library discuss the realities, challenges and future impact of open access in the research community

Notably, 2023 marks a decade since two important events. Not only did David Bowie return to releasing records, but Research Councils UK (the predecessor to UKRI) launched its open access policy. This was a watershed moment for UK research, a clear statement of intent to make open access a full-scale reality. But 10 years on, it is pertinent to ask, where are we now?

The dawn of the open access era

Something equally seismic has happened since 2013 – the launch of Plan S, with its aim of supercharging open access. As David Crotty argued in 2019: "Plan S is a deliberate attempt to accelerate change, throwing a comet into a complex ecosystem in hope that it will produce mammals, rather than mass extinction." So are we seeing the emergence of new mammals, the beginnings of mass extinction, or something else entirely?

In fact, 2022 certainly witnessed a continuing paradigm shift, particularly UKRI's open access policy coming into effect for articles and conference proceedings. This represents a step-change to full and immediate open access for publicly funded research, and essentially incorporates Plan S into the UK research landscape. Similar policies have been launched by other funders, including the National Institute for Health & Care Research and Cancer Research UK.

Moreover, 2022 saw the release of the Research Excellence Framework (REF) 2021 results, marking another milestone for open access. REF 2021's open access mandate for journal articles and conference proceedings has arguably had the greatest impact in driving open access engagement by researchers. What was once a niche pursuit opposed by many researchers is now overwhelmingly regarded as an everyday part of the research lifecycle. There is a growing sense of positive engagement too, with researchers increasingly publishing open access because they want to and not just because they have to.

Balancing the publishing equation

At the same time, the shift of payment from read to publish represented by transformative agreements has continued. Most notably, this included the UK deal with Elsevier. In the words of Liam Earney, Managing Director of Higher Education & Research at Jisc, this represents "a major step in the transition towards full,

→

→ equitable and affordable transition to open scholarship" and is Elsevier's largest transitional agreement globally. The deal also highlights the growing influence and agency that libraries have. For the first time, large parts of the sector had a credible walk-away plan with the ability to rapidly share digital content to maintain patron access. This is a significant rebalancing of power away from the major publishers. Proposed walk-aways in previous negotiations were essentially empty threats, but the game has now changed.

This rebalancing of power is also seen with rights retention initiatives. Policy mandates for full and immediate open access have given life to rights retention, as in certain cases it is the only route to compliance. The University of Edinburgh has been a pioneer, launching its rights retention policy in January 2022, as a result of which researchers can make their research open access via the green route in a way that meets funder requirements. A significant wave across UK universities is following, particularly in northern England's N8 group of research-intensive institutions. In many ways, this realises the potential heralded through the work of the UK Scholarly Communications Licence, a visionary idea that was perhaps ahead of its time.

So in the arc of the past decade, and during 2022 particularly, the tectonic plates have shifted towards full and immediate open access, with considerable success. About 80% of the UK's research output can now be made open access, mostly through transformative agreements. The global average is 30%, so the UK is well advanced and a leader in this space.

Clearly there is much to celebrate and giant steps have been made. But to return to Crotty's analogy, are we seeing signs of mass extinction too? Those who hoped to see the death of publishing giants and the flourishing of new modes of scholarly communication might be disappointed. Although some aspects of power are shifting towards libraries, the major publishers remain in the frame. And despite price reductions, notably from the Elsevier deal, large payments remain a reality. The money has simply been shifted from one point to another, and there remains inherent inequity. This is most stark for unfunded researchers without access to budgets, particularly at institutions which cannot afford a decent range of transformative agreements. This inequity extends beyond the UK, with research in the US indicating that gold open access via article processing charges (APCs) comes from a disproportionately large percentage of elite institutions.

"We need to see open access as what it is, a component of a wider landscape of open research and open scholarship, including open data and many other types of open practice"

This is also a challenging environment for many publishers, particularly smaller society publishers that depend on publishing revenue to fund their activities. The positive disruption across the sector risks unintended consequences, as it is in nobody's interests for these organisations to fold. However, there are promising signs, such as the adoption by several societies of the 'subscribe to open' model, where existing publishing revenue is repurposed to deliver open access without APCs.

Despite disruptive innovation over the past decade, the traditional model of the journal article remains remarkably resilient. A plethora of innovative attempts to develop new modes of scholarly communication exist, such as Octopus from Jisc. All of these are welcome and contribute vibrancy and new thinking. Yet in another decade, will they have replaced the journal article as the primary means of communicating scholarly knowledge? That seems unlikely. We need to recognise the crucial influence of research culture, and the way that traditional modes of publishing are integral to academic prestige. This will only change slowly and incrementally.

Opening up research

Open access is only one lens on the research landscape. To understand fully what has happened since the 2013 Research Councils UK policy we need to look more widely. Open access has become central to the research endeavour,

and many more researchers have become advocates. This marks a decisive cultural shift, with, for instance, senior university leaders now at the forefront of negotiations with publishers.

The impact on libraries has been even more profound, as they move beyond the existential crisis engendered by the internet and embrace new roles. Key among these is shaping and developing research culture. This is a role we have embraced at Lancaster University, particularly through forging partnerships with disciplines such as Digital Humanities, events such as Open Research Cafes, and a recent report we commissioned to explore the interplay between research culture and the future of academic publishing. We have embraced the role of being an interdisciplinary incubator, bringing people and disciplines together, realising a key theme from our Library vision (The Library Towards 2025), to be connected and act as a connector. This is indicative of libraries moving beyond just being service providers and embracing the roles of partner and leader too.

Drawing on insights to move forward

What needs to happen as we move forward? Firstly, we risk focusing just on transformative agreements and forgetting that this is not 'job done'. As the name implies, they are transformative, but not permanent, they are part of a journey, not the final destination. Typically, those in the UK last for three years, and we need to plan for what comes afterwards. Sweden is ahead in this area, having developed transformative agreements over the past five years. In a piece for UKSG, Wilhelm Widmark highlights work taking place to identify what will replace them in order to build a sustainable future.

Furthermore, UKRI's mandate for open access monographs from 2024 will herald a new paradigm shift. This has the welcome potential to more fully engage arts and humanities disciplines in open access. But what this next stage of open access will look like and what unintended consequences may result remain uncertain. In particular, the book processing charge model presents substantial challenges. Their exorbitant cost, often five figures, makes them unaffordable to those without large research grants or generous open access budgets, which could once again bake inequity into the system. Part of the solution is diverse routes to open monographs, including smaller presses and new business models. There are many promising signs here, including the establishment of Aberdeen University Press, and the inter-institutional Scottish Universities Press. Such initiatives, typically with more affordable author fees, provide a necessary levelling of the playing field. But again, culture is key. Perceptions about publishers are keenly held, and it would be a mistake to assume that 'if we build it they will come'. Most authors will likely prefer their traditional publisher to a new and untested startup. Again, libraries need to look at how they can influence research culture, such as identifying early adopters of new publishing initiatives and partnering with them to advocate to others.

Another key facet of moving forward is looking beyond the UK. Europe has been at the vanguard, but 2022 saw significant change in the US. President Joe Biden's administration issued an expectation for full and immediate open access to federally funded research from 2026. And this trend continues elsewhere, such as in New Zealand, where all research funded by the Ministry of Business, Innovation and Employment will need to be open access. The picture for the global south is more challenging, particularly given affordability challenges of APCs.

Yet we mustn't view the global south through a Eurocentric lens. As Haseeb Irfanullah highlights, there is much activity that is invisible to the global north. For instance, Bangladesh has several hundred peer-reviewed journals published by societies and institutions, almost all of which are fully open access through platinum or diamond models. However, very few are indexed in sources such as Scopus, resulting in a form of 'scholarly isolation'.

These other open access worlds need to be brought into the discussion, but this should be achieved through partnerships of equals, rather than a set of misguided and neo-colonial attempts to 'educate' the global south. We must recognise we are all part of a complex global network of scholarship that is far more varied and nuanced than our Eurocentric view suggests.

The future of open access

So where are we now, really? We're in a very different place to a decade ago, and there has been a sea change, both in the delivery of open access and attitudes towards it. Yet to continue that change and challenge inequities, we need to focus on the end goal. What are we ultimately transitioning to, and will it actually deliver the long-anticipated benefits of open access? Firstly, we need to see open access as what it is, a component of a wider landscape of open research and open scholarship, including open data and many other types of open practice. It is only through advancing this entire agenda that we will realise the benefits of open access. Likewise, we need a truly international approach

"These other open access worlds need to be brought into the discussion, but this should be achieved through partnerships of equals, rather than misguided and neo-colonial attempts to 'educate' the global south"

that avoids silos of excellence in certain countries. The promise of creating a fairer and more equitable system of scholarly communication means nothing if it doesn't extend globally. And it must do that through partnerships of equals that recognise progress and innovation in the global south.

This will not be perfect. The idea that we can sweep away the established publishers to create a cost-free open access utopia is for the birds. But just because it may not be perfect, doesn't mean that it isn't a vital paradigm shift. And we should absolutely challenge the vested interests of publishers where they don't align with the interests of publicly funded research, as Plan S has done stridently. At the core is cultural change, which is slow, incremental, and involves winning hearts and minds. But the way in which researchers and university leaders are increasingly invested in open access, and are more willing to take on those vested interests, points to a bright future.

Finally, open access must ultimately be about impact. In a world with a cost-of-living crisis and a climate crisis, it's not enough for the impact of research to just be about citations. Open access must result in research making a real difference to people's lives and addressing the challenges faced by the world. To simply make research paid for by taxpayers available is not enough. It needs to change our lives for the better too.

Thomas Shaw *is Associate Director of Digital Innovation and Open Research and* ***Andrew Barker*** *is Director of Library Services & Learning Development at Lancaster University Library.*

STEPPING UP THE CHANGE: HOW WAS THE TRANSITION TO OPEN ACCESS ADVANCED IN 2022?

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Despite the collective and decisive step changes in enabling the transition to open access this year, we should not be complacent, writes **Susie Winter**

Undoubtedly, 2022 has been a year of growth for open access (OA). Funder policies and deadlines have come into play and, as a result of the pandemic, the impact and benefits of open research and open access are now better understood by people beyond academia.

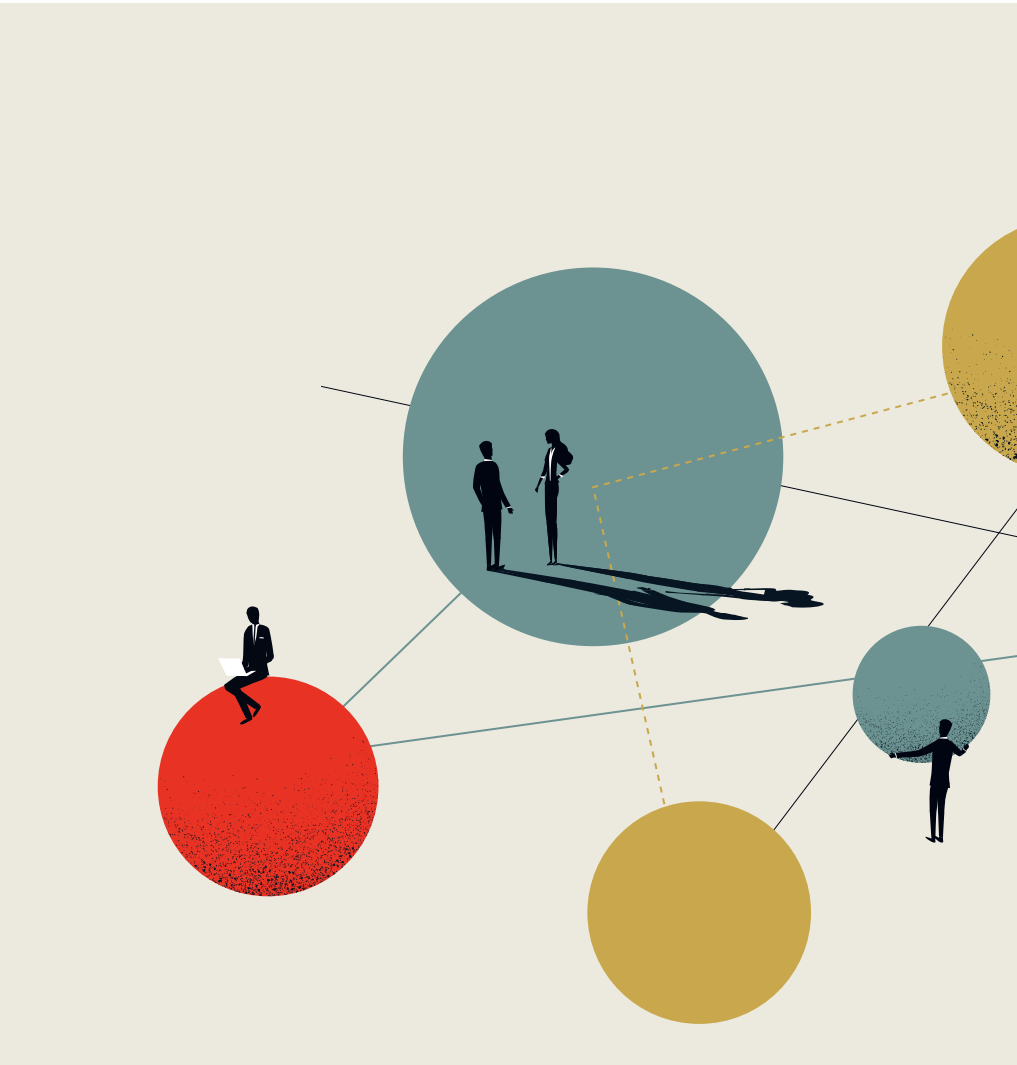
Overall, two themes featured strongly – the need for OA take-up to become more global and the importance for authors to remain able to publish in their journal of choice. Taken together, these themes were instrumental to enabling OA growth in 2022.

Open access going global

To date, the story of the transition to OA has, with some notable exceptions, been overwhelmingly European, driven in part by the high number of successful transformative agreements (TAs) signed between European institutions and publishers. These agreements are helping to speed up the transition to OA and ensure OA is an option for all, regardless of discipline, location or funding.

In addition, 2022 can be seen as the year this story began to be rewritten, with the growth and expansion of TAs outside of Europe and on a scale not seen in previous years. Wiley, Springer Nature and Oxford University Press announced agreements with Japan, signalling a clear indication of the county's commitment to transitioning to an OA environment. Springer Nature's pioneering examples in the Middle East, with Egypt, and in Latin America, with Colombia and Mexico, have demonstrated the value of the approach in regions where uptake in OA has been slower and more complicated due to challenges in research funding, awareness and uptake. The transition to full OA is meant to benefit the whole world and the expansion of TAs in 2022 beyond the western bubble shows that the desire and ability to work through the practicalities are also global. Some of these examples illustrate the benefits of a commitment at a national level, from →

"We will continue to support solutions that maintain author choice, while advocating for the benefits of publishing OA"



funders and governments, for their research output to be immediately available from the moment of publication, via the gold OA model. To achieve sustainable national OA transitions, ultimately leading to a full global transition, such commitments need to become the default approach.

When we look at the policy developments that have taken place this year with a number of countries reviewing their approach to OA and considering policy recommendations to speed up the transition, this move beyond Europe is likely to continue:

- **USA** The White House Office of Science and Technology Policy (OSTP) has updated the US policy guidance to make the results of taxpayer-supported research immediately available to the American public at no cost.
- **Australia** The funding agency, the National Health and Medical Research Council (NHMRC), has introduced the requirement that scholarly publications arising from the research it funds be made freely available and accessible.
- **India** The Ministry of Education has announced the deadline for the launch of the "One Nation, One Subscription" (ONOS) policy for scientific research papers and academic journals from April 2023 to ensure countrywide access for researchers and the broader public.

In 2023, we are likely to see even greater take-up of OA by authors. Moreover, publishers, such as Springer Nature, continue to be ready to work with funders and others to ensure these policies drive the OA transition in a sustainable way while ensuring the needs of the researchers continue to be met. For a long time, we have had the 'supply' (the ability to publish OA). What we have been waiting for is the 'demand' (authors wanting to publish OA).

Author choice

Researchers still want to be able to publish in the journal of their choice, regardless of funding, discipline or location. The challenge has been to ensure that this central tenet, the freedom to publish your article where you want, is not undermined by the transition to OA.

While transformative agreements (TAs) have proved instrumental in enabling authors to publish OA and are now being signed in regions which to date have seen low OA take-up, the fact remains that only authors from participating institutions benefit. What then about authors from regions or institutions where TAs remain challenging? TAs are complex to negotiate with no one-size-fits-all model. Each needs to be negotiated individually to take account of particular situations and circumstances, and this takes time.

This is why in 2020, Springer Nature proposed the concept of a transformative journal (TJ) – a journal which is committed to transitioning all of its primary research content to OA. This meant that authors whose funders were requiring their research to be published OA, but prefer journals that are OA or are committed to transforming to OA, can be supported by their funder to do so. So even if such authors do not have access to a TA they are still able to publish in their journal of choice. The success of this approach can be seen in the first annual data released on TJs earlier this year. At Springer Nature we saw a 40% increase in gold OA research articles published in our TJ titles

"Researchers still want to be able to publish in the journal of their choice, regardless of funding, discipline or location"

in 2021 compared with 2020 (by contrast, subscription article numbers grew only 8.4% in the same journals).

We will continue to support solutions that maintain author choice, while advocating for the benefits of publishing OA. These benefits will remain front and centre in our author communications – more research and transparency around the impact of OA for authors is needed to unlock the ultimate benefits of open science for science and society as a whole. It can't be either/or in terms of author choice and open access – researchers must be supported and engaged by funders, governments and publishers in the process if we are going to be able to achieve a full global OA transition.

Looking ahead

What needs to happen in 2023 to continue the progress made in 2022?

1. Increase demand – while, for example, the first annual TJ report showed a strong uptake in OA choice, continued hesitancy from funders on the demand side continues to present a real challenge to any full move to open. More needs to go into raising awareness and providing funding support for researchers to publish OA.
2. Funder engagement – while there are positive signs globally, support from funders for gold OA in particular remains low. The membership of cOAlition S has hardly changed since it was formed in 2018, with one newer member not supporting TJs. In addition, promotion by some funders of zero-embargo green OA works against a full transition. With a dependency on ongoing library subscriptions for access to the version of record, the green route only serves to slow down the transition and doesn't offer the benefits of higher citations and increased downloads that come with gold open access.
3. Development of technologies to support the transition – OA and the associated workflows can be complicated for researchers. Whether it is in identifying funding options or where and how to share data, code or early version, a lot of pressure is placed on researchers and their workflows need to be as simple as possible. Technologies and platforms to enable this have a core role to play in supporting a more streamlined, simple, open publishing experience.

Publishers, institutions and researchers have been working together for many years to transition to making OA a reality and to ensure that we collectively create a more efficient research system to support immediate access to research. Despite the positive, decisive step changes in enabling that this year, we should not be complacent. There is still a way to go, but if progress in 2022 has shown us anything, we are on the right path and accelerating towards our common goal.

***Susie Winter** is Vice President of External Communications, Springer Nature*

PUBLICATION AND DATA SURVEILLANCE IN HIGHER EDUCATION AND ACADEMIC LIBRARIES

Joseph Koivisto and Jordan Sly from the University of Maryland discuss the implications of the publications-as-data model

It is becoming increasingly clear that the core functions of higher education are destined to be quantified and that this data will be harvested, curated, and repackaged through a variety of enterprise management platforms.

All aspects of the academic lifecycle, such as research production, publication, distribution, impact determination, citation analysis, grant award trends, graduate student research topic, and more can be sold, analysed, and gamed to an unhealthy degree. By unhealthy, we mean constricted and self-consuming as the output we develop is directly contingent on the input we receive. Well-meaning tools, such as algorithmically derived research suggestions and citation analysis, create a shrinking and inequitable academic landscape that favours invisibly defined metrics of impact. These are then reinforced through further citation, thereby limiting the scope and scale of research available.

But we know this, right? The quantification of research is nothing new, nor is the search for additional areas of impact analysis. We do not have to think hard to remember the bad old days of alt-metrics and the measuring of our social media presence as a factor of our scholarly profile. More disruptive and more harmful are the new ways in which the data we produce – both intentionally and unintentionally – are packaged and resold to us in ways that will further constrict this research pipeline and the seemingly practised naivety with which enterprise vendors are approaching these thorny questions.

The overreliance on metrics belies misunderstood beliefs that numbers must be objective and that these measurements must have an enhancing effect on the research, teaching, and other aspects of the academic enterprise. This is not unique to academia, of course. As Theodore Porter has discussed, metrics and assessment allow administrators in all areas of education, government, and industry to make decisions without seeming to decide, to trust in an imagined purity and objectivity of numbers.

In academia we see this primacy of calculable metrics in the form of citation counts, impact factors, and h-indexes among other domain-specific metrics. This reliance has fostered an environment in which academic success is confined to a narrow range of quantitative measures as opposed to measuring true scholarly merit. Several recent studies, including some that present strikingly important data, such as University of Maryland's Michael Dougherty[1], highlight the gaps and biases endemic to metric-based assessment approaches and the ways in which tenure and promotions committees can adapt to a reliance on actual scholarly quality instead of these faulty metrics. The problem is, this is hard. This is a time-consuming and intellectually taxing activity and, from the university administrative perspectives, difficult to achieve at scale. This is how we have ended up in the situation we are in and the space in which innovative enterprise companies correctly see an opportunity for vertical integration and end-to-end or closed-loop systems to address these needs.

To many, quantification actuates prestige and determines selectivity, both in the hiring of professors and the selection of students,

and creates an elite university setting. As Pierre Bourdieu showed in his 1984 *Homo Academicus,* however, this is not an evenly distributed sentiment across all areas of the university [2]. In addition, Stefan Collini discusses the economic incentive of universities to quantify and focus on the impact of particular disciplines over others, highlighting the business entanglements of the modern university and the corporate sponsors feeding both ends of the cycle[3]. Importantly, the competitiveness of a university depends on precise metrics facilitated internally, yet levered externally. What is of central concern to us is the ways in which this constricting influence impacts both the research output of specific fields and the ways that this reliance on metrics fosters an unequal environment of output favouritism.

Recently, Sun-Ha Hong has written about the notion of 'Prediction as Extraction of Discretion' which studies this reliance on extracted data as self-consuming and the ways it reflects the input model the developing data cycle relies on. In other words, it creates and reinforces the world it reflects[4]. In Hong's work, this model reflects behavioural and punitive technology, but the same can be said of the reliance, replication, and canonising of work creating an academic hegemony that could hinder innovative research due to the reliance on this cyclical model for grant awards, citation, publications, graduate student thesis development, and much more. We've seen these shifts in the broader tech world, as work such as Shoshana Zuboff's *The Age of Surveillance Capitalism* have shown[5].

Within higher-ed tech literature, too, thinkers such as Björn Brembs have written about algorithmic employment decisions in academia[6]. What is concerning is the active push to commoditise user data without reference to or acknowledgement of the issues that have caused concern in the wider consumer-technology sphere. As we see these continued pushes into the academic enterprise world, the avoidance of questions around data privacy, usage and algorithmic bias is concerning. This situation is made potentially more dire with innovations in generative artificial intelligence (AI) and the discussions around AI-generated academic content pulling from this set of enshrined data and content we are describing.

This problem is not restricted to universities. The prestige journal publishing apparatus, too, is reliant on the notion of metrics to calculate pole positioning in this competitive space. As Michael Callaham and his co-authors have shown, there is such a reliance on these metrics that the impact factor and prestige of the journal outweighed the value of the actual scholar and scholarship[7]. Additionally, as Daniel Klein and David Chiang found, this metrics-based emphasis showed evidence of citational bias; that by following the high-impact citations, scholars were unintentionally promulgating a strain of academic ideology that favoured specific disciplinary interpretations and not others[8]. Critically, this all happens in the opaque black-box of proprietary information.

What about the counter-movements and their impact?

As the shift to open access gains momentum, there is danger of the unintended consequences as enterprise platforms seek to maximise profit as the models shift from under their feet. As Alexander Grossmann and Björn Brembs discuss, the cost creep incurred by libraries reflects this pivot to a model of author costs, which are often supported by libraries, thereby adjusting costing methods from the back-end subscription model to the front-end pay-to-publish model[9].

It is not surprising or controversial that for-profit enterprise, database and academic platform vendors are seeking to turn a profit. We should remain vigilant, however, to academia's willingness to find the easy and convenient solution without considering the longer-term effects of what they are selling. In a recent industry platform webinar, academic enterprise representatives discussed the "alchemy" of user-derived data and their ability to repackage and sell this data, with consent, to development companies with their key takeaway being a driver towards increased revenue.

More to the point, they had learned the lessons of the tech industry, and more specifically the social media companies, in understanding the data we generate can be used to target us, to sell to us, to use us for further development. They discussed the ways in which the use of this data would become, like social media, intelligent and drive user behaviour – further cinching the knot on the closed-loop as algorithmically based suggestions constrain research and reinforce a status quo enabled by the profit motive in the guise of engagement, use, and reuse.

Updates on the latest industry initiatives around data and technology

Recent industry events illustrate the pressing nature of this issue in the contexts of both higher education and libraries. In 2021, Clarivate – the data insights and analytics company that owns Web of Science, EndNote, InCites, Conversis and more – moved to acquire ProQuest, one of the largest publishers of academic resources. Bound up in this deal was a wide suite of library systems owned by ProQuest, including Ex Libris and Innovative Interfaces, providing Clarivate access to almost all stages of scholarly work and communication – from research development to publication, dissemination, and discovery. This raised sufficient concern that the merger was delayed while the Federal Trade Commission conducted an antitrust review. Several academics have expressed trepidation that so many elements of the scholarly communication lifecycle could be held within the hands of a single corporate entity. However, the merger finally went through in December 2021.

"What is concerning is the active push to commoditise user data without reference or acknowledgement of the issues that have caused concern in the wider consumer-technology sphere"

Clarivate's move also appears to have sped up the academic vendor arms race, with competitors worrying about decreased market share in the face of a behemoth end-to-end enterprise. In 2022, OCLC, a bibliographic data and library system vendor, sued Clarivate, claiming that its development of MetaDoor – an "open platform for sharing cataloguing records" – represented predatory market behaviour and tortious interference in OCLC's contracts[10]. The two parties settled the case in November 2022, with Clarivate agreeing not to develop a record exchange system of MARC records that include those which OCLC has claimed are subject to its policy and contractual limitations.

Elsewhere, Elsevier – a major competitor of ProQuest – moved to acquire Interfolio, a company offering research career management and impact assessment tools[11], demonstrating a tit-for-tat escalation of direct corporate competition to secure a →

→ full spectrum of research management and analytics tools.

Elsewhere in the academic market, the move to more fully embrace AI as a facet of the scholarly communications lifecycle continues. Notably, Gendron, Andrew, and Cooper[12] observe that the increasing prevalence of AI in peer review by companies such as Elsevier, Wiley, and Springer excises critical human judgement in the evaluation of scholarship and serves the capitalist interests of these corporate entities rather than academic interests and values. In addition, they note an over-emphasis on quantitative metrics such as h-index and impact factor, illuminating the principles – and computational biases – that guide these AI algorithms. Furthermore, the total surveillance approach that is needed to drive AI approaches to peer review necessitates the university's complicitness in underwriting corporate data capture and establishing what Tressie McMillan Cottom[13] refers to as "private data worlds", opaque corporate data sets that defy democratic inquiry and evaluation.

What can be seen from these recent events is the increased primacy of quantitative scholarly metrics as the defining measure of scholarship coupled with corporate efforts to provide software suites that enable end-to-end service of the scholarly communications lifecycle. As more elements of academic enterprise management are provided by individual corporate entities, the impact of assessment and citational bias grows in magnitude.

Furthermore, data collection and analysis activities become increasingly streamlined as individual vendors will be able to pressure numerous institutional divisions – schools and departments, administrative offices, libraries, and more – to conform to data standards and practices that align with corporate needs. Such monolithic vendor suites also pose a threat of "university captivity", leaving institutions with little recourse to oppose or escape the methodologies of a single-source vendor[14].

The technology landscape for 2023

Following the settlement of the OCLC suit, Clarivate's Gordon Samson, in a statement issued by the company, responded noting that "Clarivate will continue to support the goals of open research and data exchange – because we believe it is the best way to make the process of research and learning faster, more robust and more transparent"[15]. What is notable from this response is the redoubling of notions of data distribution and use as Samson says "when scholarly information is easily accessible and shareable, the dots are easier to join, the connections are explicit, and collaborations are more natural and meaningful". Taking this statement as plain fact, the goals are laudable, but given the context we have discussed, it is not clear that companies like Clarivate are seeing the problem the same way that many of us in higher education are. The ease with which they describe this data pipeline is the selfsame problem inherent in the reliance and overuse of metrics, but from a different angle and with a marketing sheen.

As the market for scholarly communication and academic enterprise management platforms continues to consolidate, the potentially negative impacts of hyperfocusing on metrics and analytical monoculture distil to the point that the bias inherent in one facet of the scholarly lifecycle infects all downstream products. Market consolidation is likely to continue apace in the near future. Universities will continue to seek out new solutions for their management needs, finding themselves in the unadmirable position of picking between a handful of vendor solutions with little recourse to effectively advocate against coercive data practices.

As scholars are seeing the increased need to work within this highly metrics-based environment, innovations in AI and algorithmically defined research parameters are increasingly needed to keep up with the volume of literature (as Chubb et al has recently written)[16]. As

A holistic view of data operations and interoperability in research

Neal Dunkinson, Head of Professional Services at SciBite, tells us why we should consider taking a data-centric approach to computational processing of research data in 2023 and beyond

This year, there has been a marked evolution in how companies think about their research and data assets, and the technologies they apply to 'unlock' scientific information, as the volume of data they handle has continued to increase. Interest in the role of machine intelligence in retrieving and disseminating data remains high, but 2022 has also seen companies mature their thinking around the application of computational approaches. Researchers are increasingly realising that although artificial intelligence and machine learning can have huge value, they serve as tools in a process rather than complete solutions that can single-handedly solve data management challenges. At SciBite, our conversations this year with customers have evolved as a result. Whatever they want to build 'downstream' – whether a knowledge graph, a new ontology or a new search console – they realise that the quality of the data going 'in' upstream is critical. That quality deficit is what many are looking to address in 2023.

Consequently, what is emerging now is the need for a data-centric approach to computational processing, rather than the typical application-centric approach. This is going to pick up steam in the next 12 months as companies look holistically at their current research stack with a focus on data operations and interoperability. Today, research environments are extremely complex and fragmented, involving many different applications from multiple vendors. Although making individual datasets machine-readable is valuable, these measures are often considered at an application level only, resulting in data becoming siloed and limiting it from moving freely through the research environment. Many are already convinced of the need to 'FAIR-ify' data, the challenge they face is how to do it so that individual datasets can inform one another. Therefore, 2023 is the year to look toward proven and dependable competencies that can deliver the value everybody in the industry is seeking. As part of this trend, I expect to see practical industry-wide efforts like the FAIR Implementation Project from The Pistoia Alliance gather even more interest, as well as the adoption of software and technology that has a high degree on interoperability 'baked in'.

Neal Dunkinson *is the Head of Professional Services at SciBite (part of Elsevier)*

these researchers note, however, we are sacrificing research creativity and research synthesis in order to simply facilitate more and more stuff to cram. Through this process, we shrink the impact of quality work to note its metrical place within a sea of scholarship as opposed to the novel ideas and methods used.

Additionally, as we have seen in recent years with the exponential rise in conspiracy thinking and internet radicalisation, algorithmically derived suggestion engines create and foster rabbit holes of increasingly self-referential and cyclical content myopia. If exported to the academic research enterprise in even more direct ways, the same could be true of research, as it will continue to valourise the metrics-based echo chamber, but in a novel fashion. Automated peer-review and scholarly assessment, algorithmically informed hiring and promotion decisions, and library collection practices driven less by professional insight and more by ecommerce-like suggestions and bundling become not a far-flung possibility, but a probable future.

While the market momentum seems to be on the vendors' side, voices increasingly critical of this shift towards algorithm/AI-informed scholarly practices and market consolidation are finding a greater foothold. As we have presented here, scholars, administrators, and librarians strive to highlight the deleterious aspects of these changes within our professional lives. These perspectives may be, at times, narrowly focused on the localised impacts within particular scholarly domains, institutions, or divisions. As these critical perspectives continue to evolve, it is likely that a holistic critique will appear and lend greater credence to what may otherwise be viewed as merely anticapitalist conspiratorial thinking.

Furthermore, as these critiques gain traction, it is our hope that it will inspire academic leadership to reflect on how our practices – of assessment, evaluation, procurement, funding – subsidise corporate consolidation and shifts towards algorithmic and AI-based assessment models.

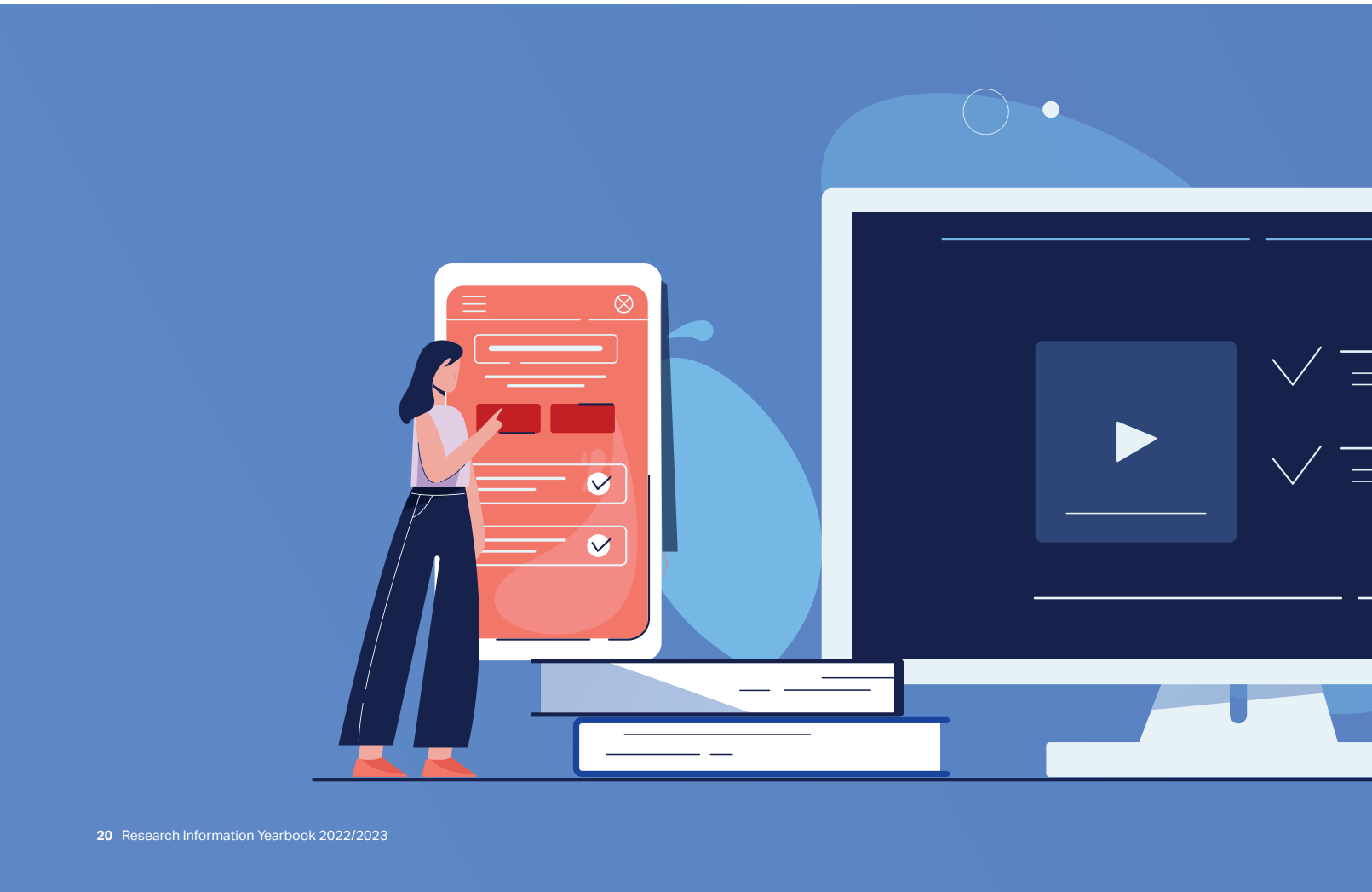
Jordan Sly *is Head of Humanities and Social Science Librarians and* **Joseph Koivisto** *is Systems Librarian at the University of Maryland Libraries.*

References

[1] Dougherty, Michael R., Rosalind Nguyen, and David A. Illingworth. 2019. "A Memory-theoretic Account of Citation Counts." PsyArXiv. September 16. doi:10.31234/osf.io/zst69
[2] Bourdieu, P. Homo Academicus, 1984.
[3] Collini, S. Speaking of Universities, 2017.
[4] Hong, S-A, 2022, "Prediction as Extraction of Discretion"
[5] Zuboff, S., 2019, "The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power"
[6] Brembs, B., 2023, "Algorithmic Employment Decisions in Academia," http://bjoern.brembs.net/2021/09/algorithmic-employment-decisions-in-academia/
[7] Callaham, M., 2002, "Journal Prestige, Publication Bias, and Other Characteristics Associated With Citation of Published Studies in Peer-Reviewed Journals." JAMA. June 5. doi: 10.1001/jama.287.21.2847
[8] Klein, DB, and Chiang, E, 2004, "The Social Science Citation Index: A Black Box – with an Ideological Bias?" Econ Journal Watch. 1 (1)
[9] Grossman and Brembs, B., 2021, "Current Market Rates for Scholarly Publishing Services." F1000research.doi.org/10.12688/f1000research.27468.2).
[10] Carpenter, T., 2022, "Let the metadata wars begin." The Scholarly Kitchen. https://scholarlykitchen.sspnet.org/2022/06/22/oclc-sues-clarivate-over-the-new-metadoor-platform/.
[11] Schonfeld, R., 2022, "Elsevier to acquire Interfolio." The Scholarly Kitchen. https://scholarlykitchen.sspnet.org/2022/04/25/elsevier-acquire-interfolio/
[12] Gendron, Y., Andrew, J., Cooper, C., 2022, "The perils of artificial intelligence in academic publishing." Critical Perspectives on Accounting, 87, https://www.sciencedirect.com/science/article/abs/pii/S1045235421001301
[13] Cottom, T.M., 2020, "Where platform capitalism and racial capitalism meet: The sociology of race and racism in the digital society." Sociology of race and ethnicity, 6(4)
[14] Hamilton, T., Daniels, H., Smith, C.M., and Eaton, C., 2022, "The private side of public universities: Third-party providers and platform capitalism". CSH research & occasional paper series
[15] https://clarivate.com/news/clarivate-and-oclc-settle-lawsuit/
[16] Chubb, J., Cowling, P., Reed, D., 2022, "Speeding up to keep up: exploring the use of AI in the research process," AI & Soc, 37, https://doi.org/10.1007/s00146-021-01259-0.

FROM OPEN ACCESS TO OPENLY ACCESSIBLE

Patrick Hargitt explains why 2022 became the year that accessibility got serious



For an increasing number of publishers and societies, how to thrive in an open access world has become a critical strategy discussion in recent years. Change is now inevitable, and the benefits are more widely understood, with the pandemic making clear the real-world impact that rapid and open dissemination of research can make.

Part of the solution to this changing world for Wiley was to introduce Wiley Partner Solutions at the Frankfurt Book Fair in 2022. A manifestation of what we see in industry trends, it enables the publishers and scholarly societies we work with to grow connections between researchers and the organisations that serve them, and ensures that all research findings are widely available and reusable.

Yet thriving in an open access world goes beyond making research available to as many people as possible or making sure to address FAIR data principles. It is imperative that we now also consider how to ensure that research is as accessible as possible.

Shifting towards accessibility

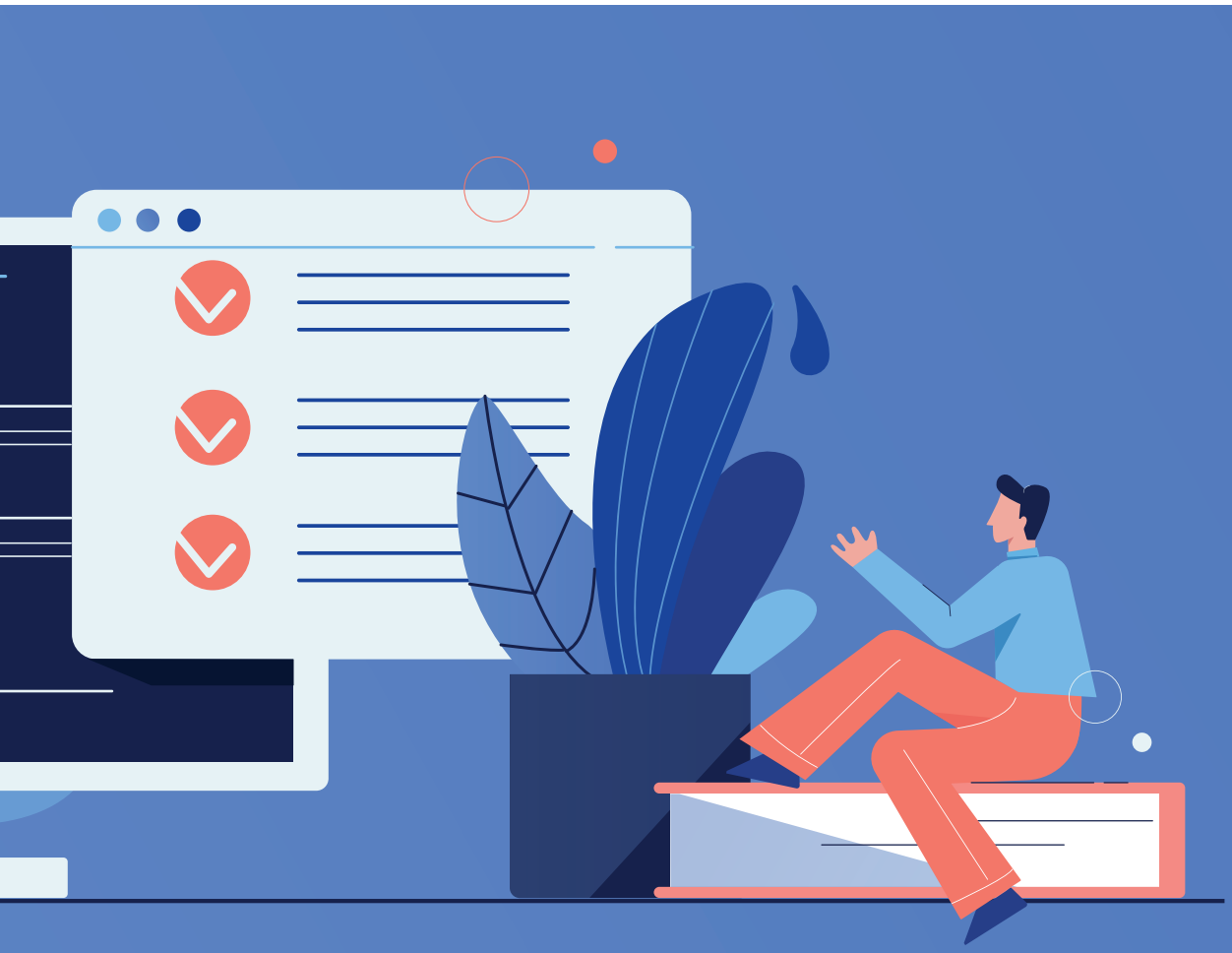
Atypon (a Wiley Partner Solutions brand) works with more than 200 of the world's publishers and scholarly societies, enabling our partners to deliver their content to academics and practitioners across every field of study. Our technology road map and development cycle are driven both by industry trends and feedback from our community, regularly solicited through online user groups, bi-annual community meetings, surveys and 1-2-1 dialogue. At the recent Atypon Community meeting in Washington DC, USA, accessibility was a topic on many customers' minds.

This is a real shift: five years ago, very few publishers or societies were talking about accessibility. In the past, publishers' accessibility requirements were typically driven by requests from institutions and libraries with accessibility written into their missions and their service requirements. Conversations with Atypon would often come when a publisher or society had received a voluntary product accessibility template (VPAT) and needed to know whether they were compliant. Now, with a growing commitment to diversity, equity and inclusion (DEI), combined with new incoming legislation and policy requirements, publishers and societies are starting to realise they need to get serious about accessibility. New requirements all content providers will need to take note of include:

The EU Directive 2019/882 (the European Accessibility Act). Coming into effect in July 2025, the directive promotes "full and effective equal participation by improving access to mainstream products and services that, through their initial design or subsequent adaptation, address the particular needs of persons with disabilities". Our expectation is this type of legislation will be quickly followed in the US.

The OSTP Nelson Memo ('Ensuring Free, Immediate, and Equitable Access to Federally Funded Research'). Although primarily about delivering greater →

> **"For an increasing number of publishers and societies, how to thrive in an open access world has become a critical strategy discussion in recent years"**



PegasuStudio/Shutterstock.com

→ availability of US Government-funded research through open access, the memorandum indicates that agency plans must outline "online access to peer-reviewed scholarly publications in formats that allow for machine-readability and enabling broad accessibility through assistive devices". It therefore places a focus not only on the availability of resources, but the ability for all to access and benefit from these.

Both of these drivers for change align with a cultural shift towards more focus on DEI at a business strategy level. The impact of this focus will be felt by technology departments: making content inclusive for all means removing barriers to access that may cause adverse socioeconomic outcomes for those with a disability.

The drivers also align with change in how researchers want to read and work. The COVID-19 pandemic forced the issue of allowing all researchers to work remotely and access resources from anywhere. All users should be able to access content, without leaving anyone out.

"Accessibility needs to be a collaborative effort, and an ongoing conversation"

Inevitably, taking time to make content and platforms more accessible benefits more than just those with a registered disability. According to the World Health Organization (WHO), more than 1 billion people have some degree of hearing loss or sight impairment, or symptoms of dyslexia. The WHO reports that this number continues to grow, because of population ageing and increases in chronic health conditions. This creates challenges for many, who will struggle with reading and comprehension, or accessing and processing web pages.

How to move forward in 2023

We have been increasingly discussing accessibility with clients over the past two years to ensure coming changes were on their radar. So the question is: how should publishers and societies take a strategy forward to deliver more accessible content in 2023? Customers have typically come to us with a general desire to improve accessibility, but without knowing how to go about it.

Essentially, accessibility is about providing all the information that a user needs. A website that is not accessible relies on visual interaction with a webpage. An accessible website includes a lot of information in the metadata or in the back-end, so that users who do not have visual ability can still interact with the page. Atypon can advise publishers and societies on how best to provide information in an accessible way.

Accessible websites

There are two components to consider. Firstly, the actual delivery of content and the visual display. Accessibility should be a priority when designing features for websites. Any updates or new functionality should support accessibility, considering semantic tagging, keyboard navigation, and screen reader support. New page designs and user experience (UX) should also take screen readers and other accessibility technology into consideration. The bulk of responsibility here lies with the platform. For Atypon, we are putting accessibility at the heart of our developments. We have developed new UX3.0 Page Builder widgets to provide a framework for accessible sites. We have developed AXEL, a new Literatum module that creates accessible and discoverable "scholarly HTML" from XML and is able to generate EPUBs from publisher XMLs. Our UX3.0 website themes were also designed to be compliant with accessibility standards. In addition, we have upgraded our eReader to facilitate the move from PDFs to EPUB, to comply with accessibility standard guidelines (Web Content Accessibility Guidelines [WCAG] 2.1 AA) and deliver a better overall reading experience.

Accessible content

The second component is about the content itself. Most of what is displayed on a publisher website is publisher-generated content, and making that content accessible is an enormous task. For example, every individual article will be accompanied by at least one figure, and in some cases up to 10–15. Each of these require alt text. In fact, every element of the site – from logos and cover images to adverts – needs alt text supplied in XML if the descriptions are to be useful for non-visual readers.

Conversations historically have been made more complex by a lack of shared understanding across the industry of what 'accessibility' actually means. But this has become easier over time with the introduction of shared standards, such as the WC3's WCAG and the EPUB standard file format that also uses the WCAG standard with additional book-specific requirements. Utilising these standards enables us to set parameters for what makes an accessible website for our clients.

The first stage for any publisher or society considering accessibility should therefore be an accessibility audit, which can be done directly by their platform team or by a third-party provider. Atypon recently introduced automated weekly accessibility reports to give clients a baseline understanding of how accessible their sites are and where there are opportunities to make improvements. We can also generate a VPAT report, which customers can use to identify improvements. In other cases, clients will bring audits conducted by third parties – including their customers – to us, and we'll work through these with them.

An accessibility audit can flag a number of potential areas for recommendations. This could be about colour readability, the display of URLs, the actual structure of pages, or about missing contextual information such as alt text for images and figures. It is helpful for publishers to know what their goals are, so that we can agree how best to meet those goals. For example, to determine which improvements to prioritise, it is important to consider which are the most-used features of the site where having some accessibility improvement would make the greatest impact to users. A key example is a publisher's registration page: if you do not have an accessible registration page then users who rely on accessibility features cannot register to the site, so cannot take advantage of the rest of the information or functionality offered. These pages are not generally the ones with the highest traffic, yet are critical in terms of broader business goals to consider.

Upstream of the content platform, publishers need to consider the production of their content. They need to talk to their typesetter, and address what needs to be added to XML to make it more accessible. They also need to work with their editors and authors on how to ensure the right content items and descriptions are added during the publishing workflow.

"It is imperative that we now also consider how to ensure that research is as accessible as possible"

Accessibility will be an ongoing process
On the whole, clients who have initiated a conversation using an audit have embraced the recommendations that these make. However, it is not always an easy or quick fix. In each case, their specific needs will be different. For Atypon, since development of products is shared among 200+ publishers and societies, any platform updates made – for example, UX3.0 widgets and themes, eReader, and AXEL – benefit all our customers and their users. We will also continue to work on tailored road maps to prioritise accessibility developments needed for individual clients.

For success, accessibility needs to be a collaborative effort and an ongoing conversation, since the journey will evolve as guidelines change, policies are introduced, or people make manual changes to their sites. Publishers that have developed quality assurance policies and processes have an opportunity to make sure that their platform is accessible in the long term.

It is good to have an understanding of accessibility on both sides of the collaboration, ideally. In some cases, clients have dedicated teams for accessibility but in many other cases, we play a critical role in education. Our role is to communicate the things that we are working on and the technical aspects of accessibility, and to provide ongoing guidance as we learn more and as guidelines or policies change. We work closely with our community experts to ensure that the journey we're on stays relevant and benefits all.

It is also important to have some flexibility because accessibility is not an exact science, and standards only go so far. Even different screen readers will interpret the standards differently, so flexibility enables platforms and publishers to work out a solution that provides the best value.

If I can leave readers with one final consideration, it is that accessibility cannot come as an afterthought. It requires proper integration at every stage of the production and publishing workflow, and needs upfront effort. All the brands in Wiley Partner Solutions have embraced the accessibility journey and will help publishers from submission to publication with modern, accessible publication workflows.

It is clear that taking the time and making the investment for accessibility will be worthwhile. For publishers leading the way – such as Taylor & Francis, who were awarded the 2021 ABC International Excellence Award for Accessible Publishing – it has been a multi-year journey addressing multifaceted issues, but the fruit of our collaborative efforts is now evident in the feedback from their customers and the quality of their accessibility audits. Their achievements may encourage others to get involved, to be curious, and consider the needs of all who wish to navigate scholarly content. For Atypon, we continue to focus on delivering accessible designs, on delivering technology solutions for increased accessibility, and supporting our clients in thinking through their accessibility journeys. It really is going to be a conversation that continues.

"It is also important to have some flexibility because accessibility is not an exact science, and standards only go so far"

***Patrick Hargitt** is Senior Director of Product Management, Atypon (a Wiley Partner Solutions brand).*

Journey to better UX will continue

Remote access to resources remains a strategic priority for organisations, says Jon Bentley, Commercial Director of OpenAthens – though the pace of change is starting to settle

In retrospect it was perhaps inevitable. After the rapid pace of digital transformation since 2020 – when pandemic lockdowns drove home the idea that remote access was not a 'nice to have', but a necessity – 2022 saw things start to settle down, as the research and education world tried to figure out what hybrid digital learning would look like.

Research organisations have absorbed the lessons from the lockdown years, and they see remote access as a strategic priority. But instead of trying to implement solutions as fast as they can, they have become more considered in their approach.

That's why, in 2023, I expect to see more focus on some of those longer term issues that still surround access to resources: user experience (UX), access controls, and analytics.

The key to all three is identity management
When it comes to UX, it's vital to remove barriers that prevent researchers and learners from signing in to content you've paid for. Seamless access controls are, of course, part of this, because you want the right users accessing the right content.

At the same time, high-level analytics can help you to understand which content offers the best value for money – and you want to do this in a way that protects the privacy of users.

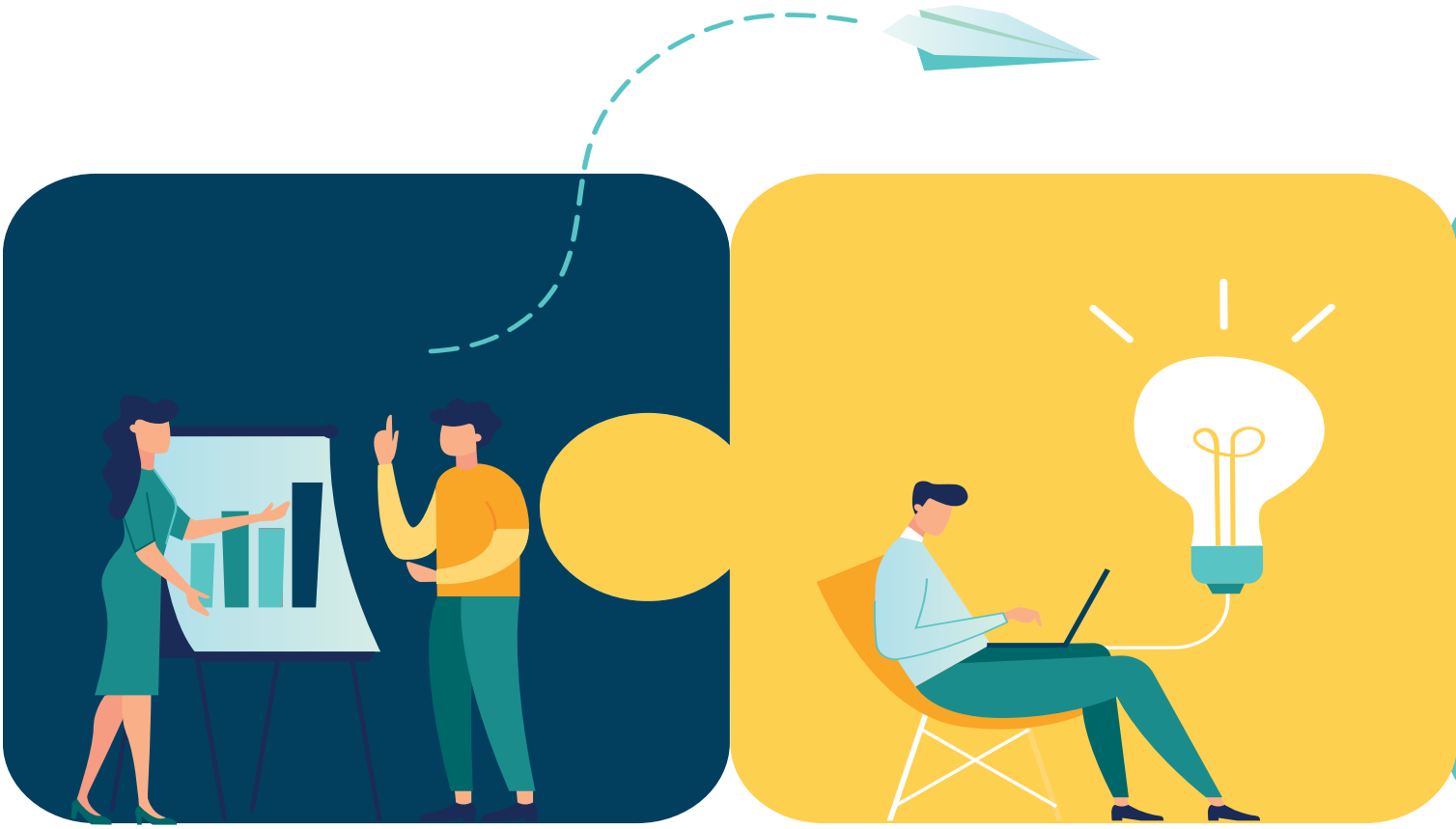
The federated access model can support this vision. Of course, more publishers need to get behind the model too, so there is work to do before the ecosystem becomes mature; the needle has shifted, but there's further to go.

At the trend level, learning providers are still on a journey toward digital transformation, and at OpenAthens we're a catalyst for that.

The goal is not "online learning" or "physical learning" – it's learning suited to the circumstances of the learner or the researcher. So the drive toward better UX will continue.

Visit our Community Hub to discover more about UX, access controls and analytics.

***Jon Bentley** is the Commercial Director at OpenAthens*



BREAKING DOWN THE REMAINING BARRIERS TO DATA SHARING ACROSS SCIENCE AND HUMANITIES

Interviews for this article have been adapted from recent PhaidraCon roundtable events and from upcoming 2023 editions of EpistemiCast

Access to an open pool of existing third-party datasets offers many benefits alongside the obvious opportunities to reduce the cost of research projects: access to additional shared data can increase the depth and scope of what is possible within any individual study; financial barriers are reduced and accessibility is opened up to less advantaged scholars and institutions and, at a global/societal level, new opportunities are created to increase scrutiny, collaboration, and the pace of learning.

However, while the will to share academic data is clearly growing, in many areas of study, there are still many practical barriers to greater implementation.

Growing awareness with a strong need for training

A 2022 study published in the scientific journal *Nature* by Dr Devan Donaldson and Wolfgang Koepke, 'A focus group's study on data sharing and research data management', looked at the issues around data sharing and reuse in detail, with a survey of the wants and needs of researchers across five fields (atmospheric and earth science, computer science, chemistry, ecology and neuroscience).

"There are increasing mandates all over the world about ensuring that data from federally funded research is made publicly available. It is about making sure that this data can be shared and reused both within and across disciplines," explains Donaldson.

"We were really thinking about how data sharing can accelerate scientific discovery. How sharing and reuse can increase return on investment for data beyond the group that produced the original data."

Compared with earlier results examined as part of his literature review, Donaldson feels there has been real progress in the awareness of the importance of data sharing and concepts such as FAIR data principles. However, as with all areas of data management he found a strong desire for greater training.

"Respondents felt that other researchers in their field were not necessarily aware of the data repositories that they could use to make data more widely available. They wanted training sessions to just let people know the options," says Donaldson. "It was clear that most respondents wanted to do a good job at data management, but didn't necessarily feel they had the tools and knowledge to do that."

Training need echoed in the humanities

A pre-pandemic report by the ARIADNE-Plus project, 'D2.1 Initial Report on Community Needs', shows a similar pattern. Between 2013 and 2019, there was significant growth in the number of archaeological research projects sharing their underlying data in some form of public repositories. The number of survey respondents sharing data for 'Most Projects' roughly doubled across a range of categories, while the number of projects not sharing data at all dropped by between 10 and 20 per cent.

However, one of the report's authors, Professor Franco Niccolucci, echoes Donaldson's sentiment: "Within the humanities there is a real need for upskilling, a change of mentality and even change to the underlying humanities methodology."

Professor Elizabetta Lazzaro, Professor of Creative and Cultural Industries Management at the Business School for the Creative Industries, University for the Creative Arts (UK) agrees: "There is a need to include more technical literacy into the humanities curriculum, to familiarise researchers with the available tools and show them how to operate them in a more active way."

First-hand experience

Originally a masters graduate in Anglophone Literature and Cultures at the University of Vienna, Marta Palandri is one academic who has already begun exploring the possibilities of greater crossover between humanities and technology. Now working as a software developer within Vienna's University of the Applied Arts, Palandri agrees that there is greater need for technical literacy to bridge the current gaps in humanities research and learning: "It's not just about tools. For many humanities scholars, basic technical literacy seems quite mystic, when it really isn't."

Palandri believes that many trained software developers have not been made →

"While the will to share academic data is clearly growing, in many areas of study, there are still many practical barriers to greater implementation"

aware of the opportunities for them within the research and academia sector: "Most developers don't see the research sector, and specifically humanities, as glamorous and exciting. And yet, there are so many intriguing possibilities for tools like artificial intelligence and machine learning to advance study within these fields. There is a real need to showcase these opportunities and champion the humanities themselves, to attract more technical talent into the space."

Opportunities for broader collaboration

One organisation seeking to address some of Palandri's concerns is King's Digital Lab (KDL) within King's College London. The lab's director, Dr Arianna Ciula, also recognises the vital importance of the human aspect of infrastructure in bridging the gap between technical skills and researchers in the humanities.

"We don't just connect researchers directly with design and development. For us, there is a vital role for research software analysts with experience in the humanities, who can bridge the gap between the research domain and technical implementation. At KDL, we also separate out a clear role for designers to focus on usability, user interaction and user experience for the researchers," she says.

Ciula sees the lab's role as a broker or bridge stretching beyond greater academic collaboration: "By facilitating robust methods around its software development lifecycle including effective sharing of data, the types of expertise embedded in research software engineering units such as KDL are well positioned to promote more mobility across sectors, between research institutions, cultural heritage professionals and the creative industries."

> **"Allowing more mobility between roles and sectors would allow everyone to harness some new opportunities more effectively"**

Looking to the future, Ciula adds: "There is real potential to not just share expertise, but to create new cross-industry career opportunities for researchers, developers, technical analysts, designers, and creative industry roles. Allowing more mobility between roles and sectors would allow everyone to harness some new opportunities more effectively."

Technology and the role of the repository

In an attempt to help researchers, Donaldson and Koepke's study looked to identify the most common 'desired repository features'.

"We were specifically interested in data management practices and how data repositories could help serve scientists in

this regard," explains Donaldson. The five most common desired features were laid out as a data repository appropriateness rubric, to help researchers to evaluate their repository requirements for future projects:

- Data traceability
- Metadata
- Data use restrictions
- Stable infrastructure
- Security

All of these features are examined in detail within the study. However, in interview with Donaldson, we focused on how the first two points can act as key drivers to increase data sharing.

Data traceability

Many of the researchers surveyed were interested in metrics and even notifications around how many people view, cite, and publish based on the data they deposit. In addition, participants wanted versioning for repositories to track any changes to their data post-deposit. While some of this was linked to researchers' desire to maintain oversight on how their data is used, Donaldson himself believes re-use metrics may also be an important motivator to drive greater data sharing.

"Scientists want to know what is happening with their data. If people have used their data to create new data, they want to know how people have built on the work that was done. I think that if we have innovation here, around these statistics and making them accessible to the people we want to deposit data, we could create more of an excitement around data sharing," he explains.

"This is why people write papers: they are adding to the discussion and seeing where it goes. If we can generate the same kind of energy around data, I think this might spur people to deposit and share their data in ways that they haven't before."

The key role of metadata

The discoverability of existing datasets is an obvious prerequisite for greater data reuse in any field of study. Within this, the metadata used to describe and contextualise data plays a key role.

"Our study found that scientists were really concerned with data searchability and data discoverability," says Donaldson. "They might not always use the terminology, but It is very apparent to me that when scientists are describing a need for data searchability and discoverability, then what they want are the metadata and data standards that could enable that."

Neil Jefferies, Head of Innovation and Open Scholarship at the University of Oxford's Bodleian Libraries, believes there is currently an issue with too many metadata standards and too much specialisation.

"This hinders discoverability because it narrows the reach of discoverability tools quite significantly. People tend to search only within their domains and the domains are very narrowly specified. This really limits the capacity for any level of interdisciplinarity or any interchange of information at a broader level. So there is actually a lot of utility in some of the more generic standards," he explains. "There is scope for a simplification of the standards to improve discoverability in terms of breadth."

Jeffries highlights the importance of Google and the regular search engines, which are still used by a lot of academics.

"Whatever metadata you have, if you can map it to things like schema.org and the more generic web-friendly schemas, then you improve the overall discoverability of those items."

Looking at recent developments, Jeffries also highlights the increasing importance of machine readability and APIs: "In the past four to five years, I have seen a massive increase in the number of machine tools and mechanisms for trawling databases and extracting useful data. And here, machine readability is essential."

Fani Gargova, a postdoctoral researcher at the Goethe University of Frankfurt am Main, believes that within the humanities, especially where research is so dependent on multi-lingualism, controlled vocabulary and persistent identifiers play a key role in making metadata more effective and shared data more discoverable.

"This is essential for making data accessible, findable and actually also machine readable. It is important to make it possible for the researchers to actually contribute to this controlled vocabulary, and also to make this more centralised, so as to reduce the number of disparate standards, definitions and ways of accessing the data."

Future automatisation

For Donaldson, one of the interesting and unexpected 'future wants' that came up in his study was how some of the respondents wanted automated metadata creation when uploading their data into a repository.

"There is a tension because, at one level, the data creator is very much aware of the context and circumstances of the creation of the data and so they are best positioned to provide metadata for it. But it is the time that it takes, or the perception of the time that it takes to provide good metadata. There is this desire or wish list, where they want metadata creation to be automated."

Jeffries believes this is very much a work in progress and that the ongoing development of persistent identifiers and broader knowledge graphs plays a key role.

"In the past four to five years, I have seen a massive increase in the number of machine tools and mechanisms for trawling databases and extracting useful data"

"Within science, you can start to look at creating persistent identifiers for facilities, for instruments and for research projects. And once you have these, they can be applied to the dataset because this is a simple transitive operation. Within the humanities we are really looking at things like people and place as the core anchors for contextualising the data," he says.

"We are now at the stage where we are starting to build these frameworks. A lot of that is in terms of persistent identifiers, but a lot of this is stuff that isn't stored directly next to the data in the repository itself. You are relying on other related repositories to provide that. This shifts your dataset into being a node in a broader knowledge graph. And what you are actually interested in, if you are interested in meaning, is capturing all of that knowledge graph.

"This isn't something that you do alone as a repository, it is part of a community process capturing all of that information. This makes it a more complex process, but also a more collaborative process."

Throughout 2023, EpistemiCast will continue to explore issues around data preservation and data sharing. There will be interviews and first-hand experiences from leaders in this field, as well as insights into the latest standards, initiatives and open technologies as they emerge.

***Raman Ganguly** is Head of Support for Research IT at the University of Vienna, project leader for the Phaidra Project and the driving force behind the newly launched EpistemiCast podcast series.*

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New models of publishing: Libraries as publishers

Simon Bains, university librarian at the University of Aberdeen, gave a brief overview of the history of university presses, as they are not a new phenomenon, but rather have had something of a re-emergence in recent years. Some of the challenges that Bains highlighted, taken from his experience at the University of Aberdeen, were of culture alignment and sustainably shifting from a more established model to the new era of open access research. Further to this, the existing model of traditional journal publishing and the reliance on impact factor metrics was interrogated. Bains concluded that publishing models need to be more inclusive and diverse if supporting open research is to become a reality.

This was echoed in Tracey Stanley's presentation where she gave the perspective of Cardiff University Press, which was established in 2014. The mission of Cardiff University Press is to create 'academic capital' and foster a research community, evidenced by their recent research excellence framework (REF) submission results. Stanley advised those seeking to build open access presses to create and build networks of researchers and other stakeholders, but also to raise the profile and visibility of the work being built. The REF is a key lever for this, according to Stanley, because "it's more about the quality of research rather than the quantity of a press' output". All of this will tie into the academic mission of the university.

Megan Taylor, who works with many researchers as part of her role at the International Bunch, outlined some of the challenges that researchers face and paid particular emphasis to the case of early career researchers (ECRs). Libraries can help this particular segment of the research community by acting as a 'one-stop shop' and implementing a clear communication strategy that is aligned with the overall university strategy. This will consequently ease institutional buy-in. Taylor ended with clear calls to action for library-publishers:

- Listen to researchers
- Give clear information and guidance to support researchers
- Increase support for ECRs
- Build interest from senior leadership.

Emma Molls, the president of the Library Publishing Coalition (LPC) presented an international context. She outlined the publishing programme at the LPC and also gave insights in to library outputs from her experience as a library publisher herself. The evolution of publishing platforms was discussed as they serve as critical tools that library publishers can use to disseminate their content. Interestingly, Molls also pointed out that the content that libraries publish can take many forms – branching away from just the book or journal content that is more commonly known. Even though this perspective is largely based on LPC members, it is clear that there are shared challenges and opportunities for those in open access research across the world.

The value of transformative agreements

Jayne Marks, from Maverick Publishing Specialists, painted a picture of what transformative agreements are and what they cover. From read-and-publish deals to publish-and-read deals, Marks gave an overview of how capped, hybrid and unlimited deals are negotiated. She said that within the acceleration towards open access, the sciences and medical fields were two examples of subject areas that are doing so faster.

Yvonne Nobis, Head of Physical Sciences Libraries at University of Cambridge, shared the other side of the story concerning transformative deals and expressed a sceptical view of the value they can bring. Nobis highlighted how open access has become mainly a commercial activity vehicle for the larger publishers, citing the Finch Report as the foundation for the current open access situation.

Nobis also pointed out that most transformative agreements are with medium-to-large publishers, which can consequently create a strain on smaller publishers and impact author choice of where to publish their research.

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Lastly, Helen Dobson, who is Licensing Portfolio Specialist at Jisc, demonstrated from her perspective that the transition to open access is a collective endeavour and involves the full range of stakeholders to engage. Dobson illustrated these points with key data that Jisc has collated from across the world. However, to centre the topic in the UK, Dobson concluded by saying that transitional agreements (as Jisc calls them) have helped the UK move rapidly to open access.

Tools referenced to assist in preparing and negotiating transformative agreements included:

- ALPSP and cOAlition S toolkit
- Jisc's explainer guide

Conforming to the REF: An international view

Research Information Live ended with a powerful discussion about research assessment and the issues within the current ecosystem, especially within the global context. On the panel, there was a broad range of perspectives on this topic, and the speakers delivered excellent presentations of the work they are doing in this field.

Jonathan Adams, Chief Scientist at Institute for Scientific Information (ISI), spoke to the importance of research assessment and the purpose set by the research body, whereby it is now a formalised process that is factored into funding formulas on many levels, including government and policy.

Adams shared data from a recent report from ISI, which showed that the relative citation impact (a measure of research output) is increasing in many countries across the world, especially in the UK. He also stated that research assessment has changed the way that research management is now done and viewed. These changes in management, however, were before the advent of research assessment – this was seen particularly in the data gathered from Australia, and Adams cited an increase in international collaboration being a factor in this increase in output. Adams concluded by saying that the "global context has a profound influence on national research outcomes. This acts through the individual researchers and their networks, but national policy may tweak, steer and incentivise".

"Researchers have new frontiers, so it is important that this is a global reform"

Vinciane Gaillard, Deputy Director for Research and Innovation at the European University Association, shared details of her work, particularly with the Coalition for Advancing Research Assessment (COARA). Gaillard stated that the research system is unsustainable in its current state, especially the cost to the individual researcher and their mental health. So the work at COARA seeks to reform research assessment at all levels and with all actors, so that change can be systemic and interoperable. To round out her presentation in a global context, Gaillard ended by saying "researchers have new frontiers, so it is important that this is a global reform."

Last but not least, Stephen Curry, Chair of the Declaration on Research Assessment (DORA) steering committee, presented his perspective on the issues with the UK-based framework for research assessment, the REF. Firstly, he made the argument that the 'excellence' in the name creates a focus on the output rather than the researcher, which can consequently introduce bias into the system. There is a need for greater transparency as well, which all the speakers agreed with, especially as we are moving towards open research. Curry made the case for taking a closer look at research culture and how it ties in with research assessment. Some changes have already been made for the next REF submissions, as Curry mentioned.

Together with the work happening in the UK, Europe and further afield, the research assessment landscape is definitely evolving in the global context and this will involve all stakeholders in the research ecosystem.

Research Information Live took place on 6, 7 and 8 December 2022. Recordings are available on the Research Information website at www.researchinformation.info.

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