

COAR Strategic Analysis of the Scholarly Communications Environment

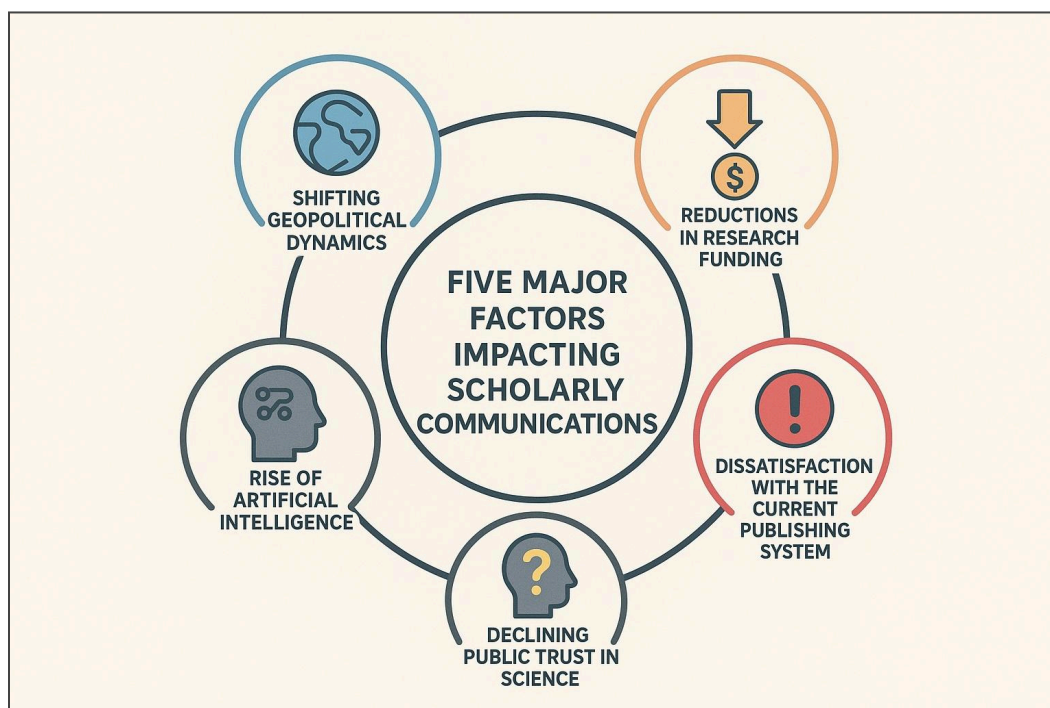
Kathleen Shearer, Executive Director, COAR

November 27, 2025

This report presents a brief overview of the socio-political landscape for scholarly communications and describes some of the major forces that could significantly impact the repository ecosystem in the coming years. The aim is to provide COAR members with a synopsis of current trends that may affect repositories as well as to inform the development of the next COAR Strategy to be published in December 2025.

The landscape analysis is based on input from a survey of COAR members that took place in August/September 2025, a review of the literature and consultations with experts in the scholarly communications space, as well as feedback from the COAR Executive Board. COAR sincerely thanks everyone for their extremely valuable input in developing this document and in helping us to craft a more effective organisational strategy for the next three years.

As part of this analysis, we have identified several evolving and potentially volatile forces that are likely to have a significant impact on scholarly communications, open science, and repositories in the next three years. Each of these five forces is briefly described below.



1. Digital sovereignty and shifting geopolitical dynamics

Shifting geopolitical allegiances and rising political tensions between certain countries are reshaping the international research ecosystem. These changes are already affecting the [nature](#) of global research collaborations and shaking up the status quo of the international research ecosystem. The typically large U.S. research footprint will likely decline due to domestic funding cuts, while countries [such as China](#) continue to expand their research presence. Other countries, in Europe and [elsewhere](#) are redirecting funding toward defense-related research. At the same time, the concept of “digital sovereignty” is gaining traction, with countries seeking greater national control over digital services and data; a trend that could extend into the research and scholarly communications arena. Whether this will have repercussions on the tremendous power of the current ranking and incentive systems that drive researchers to publish in international journals is an open question, although [some are predicting](#) it could trigger further moves towards the use of local infrastructures and services.

2. Reductions in research funding

Several countries are, or will soon be, facing significant reductions in research funding due to shifting national priorities or economic downturns (e.g. [The Netherlands](#), [United States](#)), while others are moving away from funding basic research (e.g., [Australia](#)). These trends are likely to impact library budgets and the scholarly communication services they support. In regions where funding cuts are particularly severe, some critical open science infrastructures that rely on institutional or government support may even disappear. Many libraries will be forced to make difficult decisions about which resources and subscriptions to maintain, certainly leading to cuts to various services. While this situation presents a risk to open science, it may also offer an opportunity to redirect funds away from high-priced commercial publishers toward lower-cost, community-managed alternatives. Such circumstances could further incentivise countries to adopt shared infrastructures, which help reduce costs while preserving local governance.

“The reduced financial resources of universities may result in moves away from big publishers, or it may curtail investments in new models. Hard to say.” [Expert Consultant]

3. Dissatisfaction with the current publishing system

There is [growing dissatisfaction](#) among stakeholders with the current scholarly publishing system, which remains largely structured around prestige, legacy infrastructure, and commercial control. Despite various reform efforts, academic success for many still depends heavily on publication in high-impact journals, reinforcing elitism and discouraging innovation in publishing practices. [Outdated infrastructures and workflows](#), originally designed for print-based dissemination, persist in the digital era, creating inefficiencies and barriers to change. Meanwhile, a small number of commercial publishers continue to [dominate the market](#), extracting substantial profits from publicly-funded research while prioritising their financial interests over those of the scholarly community. This dissatisfaction has significantly increased recently, after over a decade of trying to work within the current system to transition journals to open access through pay-to-publish models and transformative agreements with [limited success](#) as many commercial journals have retained their hybrid status and [prices continue to rise](#). In addition to this, because of the emphasis on publish or perish, there has been [exponential growth](#) in the total number of journal articles over the last several years, placing huge strains on scientists and peer review systems, and may be resulting in a general decline in the quality of articles.

This widespread discontent is one of the factors prompting a variety of efforts. Most notably, many national open access policies now default to the repository route for compliance. Other reform efforts include attempts to reshape research assessment, direct funding to open infrastructures, and adoption of immediate open access policies. In Europe, where efforts have intensified, there are a range of initiatives that are gaining traction including research assessment reform (e.g. [CoARA](#)), rights retention and secondary publishing [efforts](#), strengthening the [diamond journals](#) ecosystem, and the recognition of [new publishing models](#) such as Open Research Europe and the [Publish, Review, Curate](#) (PRC) approach. China, the world's largest producer of scholarly publications, is also [expanding support](#) for local journals and open science infrastructures, signaling its interest in reshaping the scholarly publishing landscape.

4. Rise of Artificial Intelligence

“AI is an umbrella term that encompasses technologies that have very successfully been used to the benefit of society at large (Machine Learning, Natural Language Processing, Deep Learning) and more recent ones (Large Language Models, GenAI) of which, at this point, the benefits to society remain very questionable while major detriments have already become obvious (misinformation, disinformation, energy consumption). I feel that it is crucial to point out that distinction.” [Expert Consultant]

Artificial Intelligence (AI) presents many opportunities for improving scholarly communications but also brings with it significant challenges for the information commons. AI, and particularly machine learning techniques, have become [integrated into many research workflows](#) across the disciplines and this is also the case for scholarly communications. In [scholarly publishing](#), for example, AI is now being used to support activities such as copyediting, plagiarism detection, summarisation, translation, and peer review. It is also being adopted to other areas, including assisting with literature reviews, automated metadata tagging, and other curatorial tasks.

One of the most immediate impacts of AI for scholarly communications may be the way that Large Language Models (LLMs) are influencing how people access and interact with the literature. Traditional keyword-based searching is being supplemented - and even may be replaced - by AI systems that “understand” user intent and deliver personalised results, often as plain-language summaries. This shift is already shaping user expectations.

While AI-assisted discovery can help identify, summarise, and connect scholarly information across large, multilingual corpora with greater efficiency, it also raises [ethical challenges](#) concerning integrity, accountability, and transparency. LLMs add an extra layer of mediation between users and the scholarly literature, making it harder to trace scientific claims back to their original sources and raising concerns about trustworthiness and accuracy. They therefore [bring the risk](#) of oversimplification, bias, and misinformation; inaccuracies that non-experts may not be able to detect, which could result in an over-reliance on machine-generated interpretations [without proper critical assessment](#). Additionally, because AI systems operate through continuous feedback loops, each training cycle can propagate and amplify errors and biases, potentially polluting the information commons over time.

5. Declining public trust in science and scholarship

There is growing skepticism toward scientific expertise, institutions, and research findings in some regions and among certain segments of the population. Several factors contribute to this decline in trust. Scientific information can be complex and uncertain, making it difficult for non-experts to interpret, which can lead to doubt or disbelief. The [increasing politicisation](#) of science has also fostered perceptions that findings are biased or influenced by political interests, a trend that intensified during the COVID-19 pandemic. Additionally, false information and conspiracy theories about scientific topics spread rapidly on social media, also eroding public confidence. This is compounded by high-profile cases of [retractions](#), fraud, misconduct, the [rise of paper mills](#), and a growing industry producing [fake papers](#), all of which threaten the credibility of scholarly publishing. This “crisis of public confidence” has raised concern among some governments and the scholarly community, prompting more intensive [discussions](#) on how to address it, including through improved science communication, increased [public engagement](#) in research, and greater transparency and rigor in scholarly publishing.

How can repositories respond?

Taken together, these forces create a very uncertain environment for repositories and it is hard to predict how things will evolve over the next several years. However, repositories will likely maintain, and in many countries expand, their importance within the ecosystem. As localised, non-commercial, open infrastructures governed by universities, libraries, and research communities, they will continue to be a key pillar for open science by disseminating, preserving, and curating research outputs, while also supporting growing demands for digital sovereignty. Moreover, repositories are poised to become increasingly central for discovery and innovation because their collections represent open, high quality content that can serve as foundational data for machine learning and other AI tools. Four areas of action for repositories have emerged from this analysis.

I. Navigate and leverage technological change

As technology continues to evolve rapidly, repositories will have to be responsive to shifts in their environment. The growing prominence of AI search systems will bring with them new demands for repositories and other scholarly platforms. In particular, the implications of generative AI on discovery are far from understood and the introduction of new [conversational search](#) engines will likely have repercussions for how impact is measured and on accuracy of / confidence in search results.

New technology will also influence how repositories manage access to their resources. Repositories are already experiencing significant increases in aggressive crawling by bots, presumably to supply data for LLM training and other generative AI applications. A [2025 COAR survey](#), for example, found that many repositories are experiencing service disruptions and outages because of these bots. This has already resulted in some repositories adopting measures to block access by bots, but are also inadvertently impeding access of innocuous or friendly machines (such as scholarly aggregators and search) as well as human users. This could potentially slow down our collective progress towards open science across the ecosystem.

The repository community will need to adopt practices that enable more frictionless access by machines that also protect themselves from bad actors, while at the same time supporting human-oriented services. COAR has already begun work for dealing with aggressive bots to support repositories in managing some of these issues. On a related

note, there is no real consensus in the scientific community about the reuse of papers and other content in the context of artificial intelligence, with some authors and publishers very much against it, while others support as few restrictions to reuse as possible. It will be important for the repository community to be actively involved in community discussions around the future of AI in the “open science” space.

II. Build a trusted information environment

The growing public distrust in science introduces several challenges for scholarly communication infrastructures including repositories. When the credibility of research is questioned, the platforms that preserve and disseminate that research may also be viewed with skepticism, weakening their position as trusted sources of authoritative knowledge and reducing support from both the public and policy-makers. The introduction of AI into the mix, essentially acting as a block box where users cannot trace outcomes back to original sources, adds a layer of opaqueness that could further weaken confidence in the information commons.

Advancing openness, transparency, and reproducibility can help to counteract this spreading crisis in confidence around research. As open and non-commercial infrastructures, repositories are well positioned to play a part in building a more trusted information environment by ensuring authenticity and long-term accessibility of research outputs. This is central to the mission of repositories, in contrast commercial systems that are driven by profits. However, to reinforce their role as dependable players in the ecosystem and guard against bad actors seeking to undermine trust, repositories may need to adopt more rigorous measures for reviewing submissions, such as by strengthening authorship and provenance practices and working with the broader community to develop trust markers for research outputs.

In parallel, dissatisfaction with the current opaque and expensive commercial publishing system and momentum for scholarly publishing reform is buoying the Publish, Review, Curate (PRC) model of publishing because it is a much more efficient and transparent alternative. PRC is an umbrella term for scholarly publishing initiatives that build on the growing trend of preprint sharing. They typically involve research communities that review open preprints, providing an evaluation and/or endorsement of articles. In most PRC models, preprints, reviews, and the final published version are all made available to the reader.

III. Enhance digital coherence

Expanding community awareness about the need for open infrastructures along with the trend toward digital sovereignty offer important opportunities for repositories, but also some risks. As countries seek to locally manage their research outputs in their own infrastructures, repositories will be one of the main mechanisms to fulfill this aim. However, a proliferation of platforms and services localised in different countries (some in competition or conflict with each other) could also result in fragmentation. It will be essential that interoperability frameworks and open standards (such as OAI-PMH, COAR Notify, affordable PIDs, quality metadata, and controlled vocabularies) are widely adopted across the global community. Not only do these practices create greater coherence in the ecosystem, they also bring the structure, context, and provenance needed to sustain a trusted information environment.

Our current federated system of repositories remains highly relevant in this environment because it enables regional and national initiatives to maintain local control while also ensuring cross-repository interoperability. Community-based scholarly aggregators, which already provide important alternatives to commercial discovery services, will help to create “collections” that support various use cases, based on disciplinary, geographic or language requirements. If PRC publishing begins to scale, it will add another layer of complexity to this already very distributed ecosystem. PRC workflows span multiple platforms — repositories and peer review services — creating cross-system dependencies and requiring robust interoperability across those two different types of systems. To maximize value and ensure integrity of the open science system, all components — data, platforms, tools, and processes — must be well-aligned, interoperable, and work together in a consistent and integrated way. This will require strong connections across different types of systems and jurisdictional boundaries.

IV. Raise the visibility of repositories

Repositories have long maintained a relatively low profile within the scholarly communications landscape, especially when compared to more visible platforms such as journals or commercial discovery tools. In some regions, this limited visibility is compounded by structural factors such as underfunding, being sidelined by research information systems, or absorbed into commercial ecosystems that obscure their role as open, community-governed infrastructure. In this context, repositories are significantly

undervalued and under-recognised by important stakeholder communities, such as researchers, administrators, and policy-makers.

As AI-mediated discovery and summarisation tools become more prominent, the challenge of demonstrating the value of repositories will only likely intensify. AI systems often draw on vast pools of data without clearly signalling the origin of those sources, making it harder to show that repository resources are fueling these tools. This shift heightens the risk that repositories could be perceived as peripheral, despite being essential to a trustworthy and equitable open science ecosystem.

Sustained and strategic advocacy is therefore critical for ensuring repositories are recognised and supported as foundational open science infrastructures. Their benefits in terms of long-term preservation, open access to research outputs, support for reproducibility, community governance, and resistance to commercial lock-in must be communicated clearly and convincingly. Yet, effective messaging cannot follow a single template. What resonates with researchers may differ from what matters to university leadership, national funders, or policymakers. Likewise, local context, such as the maturity of the repository landscape, institutional priorities, and national policies will shape both the opportunities and constraints. To maintain visibility and secure long-term commitment, repository advocacy will need to be tailored to these diverse environments, highlighting the specific value propositions that align with local needs while reinforcing the global importance of repositories as open, reliable, and future-proof components of the scholarly infrastructure.

Conclusions

The coming years will be a period of rapid change and considerable uncertainty for scholarly communications. Geopolitical realignments, tightening research budgets, new publishing models, accelerating advances in AI, and declining trust in scientific institutions are reshaping the landscape in profound ways. Yet across this shifting terrain, repositories remain indispensable infrastructures; essential not only for preserving and disseminating research but also for safeguarding openness, supporting national digital sovereignty, enabling responsible AI development, and reinforcing the integrity of the scholarly record.

This analysis suggests that repositories will continue to grow in relevance, but only if the community responds proactively to the challenges ahead. Repositories must adapt to emerging technologies, strengthen practices that promote trust and transparency, and ensure interoperability across an increasingly complex and distributed ecosystem. At the same time, they must communicate their value more effectively, demonstrating to researchers, institutions, funders, and policymakers that repositories are foundational components of open science.

As COAR develops its next strategy, these findings underscore the need for coordinated global action: supporting repositories in navigating technological disruption; promoting standards and interoperability; advancing open, community-governed publishing models; and advocating consistently for repositories as trusted, equitable, and future-proof infrastructures. By working collectively, the repository community can help shape a more open, resilient, and coherent scholarly communication system—one that is capable of withstanding external pressures while continuing to serve the needs of research communities around the world.