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Open Access eXchange (OAeX): an economic model and platform for fundraising open scholarship services

Authors' names are listed in alphabetical order.

This article describes the Open Access eXchange (OAeX) project, a pragmatic and comprehensive economic model and fundraising platform for open scholarship initiatives. OAeX connects bidders with funders at scale and right across the open scholarship spectrum through crowdfunding: financial expenditure is regulated by a market of freely competing providers and financial transactions and transparency are assured by a clearing-house entity. Specifically, OAeX seeks to facilitate open access publishing without the barrier of article processing charges (APCs), as well as contribute to solving challenges of transparency and economic sustainability in open scholarship projects in the broader sense.

Keywords

Open access; crowdfunding; open scholarship; scholarly journals; funding models

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Introduction

This article seeks to contribute to addressing the various open scholarship funding challenges from the perspective of economic modelling. It does so by proposing a marketplace mechanism for open scholarship projects that seek funding. For the purpose of conceptual clarity, the emphasis in this paper is placed on the example of open access (OA) journal publishing.

'a marketplace mechanism for open scholarship projects that seek funding'

Contextual background

Open access to the scholarly record is not only progressively on the rise but here to stay – for good.[1] Between the years 2000 and 2018, members of the Open Access Scholarly Publishers Association (OASPA) published over 1.3 million articles. Notably, 18.8% of that share was produced in 2018 alone.[2] This steady rise in output is backed up by policies and practices at national and institutional levels.[3] At European level and beyond, Science Europe recently proposed

Plan S,[4] emphasizing that '… the transition [to open access] must take place in an efficient and sustainable way, avoiding unnecessary costs. It also requires strong engagement of the research community, in order to adapt the system to a culture of sharing.'[5]

Specifically, Principle 4 of Plan S affirms that 'Where applicable, Open Access publication fees are covered by the Funders or research institutions, not by individual researchers'.[6] Plan S OA champion Johan Rooryck[7] states further that more cost-effective and DORA-compliant academic-led publishers hold equal Plan S status to established commercial publishers.[8]

However, beyond avoiding unwarranted costs towards realizing open access to the formal academic record, other factors are just as important to academic libraries and research funders. LIBER,[9] Europe's leading association of research libraries, argues that the following five principles should apply when negotiating with publishers:

- licensing and open access go hand in hand (resist double dipping)[10]

- no open access, no price increase (ensure return on investment)

- transparency for licensing deals (reject non-disclosure agreements)

- keep access sustainable (secure perpetual access to paid-for resources)

- usage reports should include open access (capture downloads of open access resources).[11]

'collective goodwill and willingness for genuine change is required … to achieve mutually agreeable circumstances'

In the realm of OA research funding, the Wellcome Trust applies stringent conditions to successful grant holders, including mandatory compliance with grant audits, regular progress descriptions and end-of-grant reports, in addition to other clearly defined requirements.[12] Essentially, such provisions aim to achieve a sense of transparency in business practice. But beyond recommendations and enforcement, collective goodwill and willingness for genuine change is required on behalf of all stakeholders taking part in the research and scholarly communication life cycle to achieve mutually agreeable circumstances.[13]

The state of communal play: OA business models and approaches

Much is written about the ethical and practical challenges around publicly funded and subscription-based (paywalled) publications excluding broad readerships.[14] The same applies to questions around pay-to-publish journals, potentially excluding authors who do not have the ability to pay for article processing charges (APCs) or have access to respective funding, agreements or waivers, as well as increasing prices in an unequitable fashion.[15] The APC model also triggers considerable administrative load for university systems and libraries.

No-fee OA initiatives, on the other hand, which impose neither pay-to-read nor pay-to-publish charges, such as the Open Library of Humanities (OLH),[16] SciPost,[17] arXiv,[18] SCOAP3,[19] AmeliCA,[20] SciELO,[21] the subscribe to open initiative by *Annual Reviews*[22] or learned-society led journals, such as TEANGA,[23] face an uphill struggle to maintain stable funding.[24] Generally, non-commercial, no-fee OA journals tend to operate on uncertain financial foundations.[25]

'The status quo presents a continuing challenge to further opening up access to published research'

The status quo presents a continuing challenge to further opening up access to published research, as well as to creating a sense of equity within the knowledge commons: cost-effective publishers struggle to sustain themselves and prosper for the benefit of the wider scholarly and public good.[26] At the same time, academic libraries continue to face tensions between supporting OA while prioritising funding for closed-subscription access through 'big deals'.[27] More recently, libraries are entering transformative open access agreements with publishers,[28] although doubts remain regarding equity and the ability to control prices within this model.[29]

Against this backdrop, commercial publishers seek to maintain the initiative by controlling the direction that academic publishing reform may take, within the context and the possibilities of a fast-moving digital ecosystem.[30] Both subscription and APC models are heavily debated in the academic community and are hermeneutically contested in praxis and in the literature.[31] Other challenges relating to entrenched socio-cultural publishing and research-assessment practices, such as the misuse of bibliometrics[32] and the prevalence of prestige economies in academia,[33] are well documented[34] and will therefore not be further discussed here.

This leads to the question of what alternative OA publishing models presently exist, or may exist in the future, beyond APC.

Crowdfunding and beyond

The practice of crowdfunding[35] in non-scholarly digital marketplaces is established and a common occurrence: examples include Kickstarter,[36] Indiegogo[37] and Crowdcube.[38] It also finds creative application in publishing: Unglue.it[39] supports free e-book publishing and has been active since 2012.[40]

In scholarly publishing, the Sponsoring Consortium for Open Access Publishing in Particle Physics (SCOAP3) successfully works with publishers to convert high-energy physics journals to OA at no cost for authors, regardless of their affiliation, using a central funding and administration mechanism to cover costs.[41] Formed in 2017, the Global Sustainability Coalition for Open Science Services (SCOSS) utilizes a crowdfunding model for open science infrastructure: funding applications from non-commercial providers of services are assessed by the SCOSS board before a funding bid is launched.[42] The Kotilava project, on the other hand, asks library-funders to regularly contribute a fixed amount for flipping Finnish scholarly journals to OA and sustaining them; critically, the market plays no competitive decision-making role in regulating levels of funding and commitment – libraries are presented a fixed fee for a fixed package of journals to support.[43] Since 2015, LIBRARIA has worked through an OA publishing co-operative model to circumvent market mechanisms, whilst also providing consultancy and advocacy around publishing in the social sciences.[44]

Open Access eXchange (OAeX)

The main goal of OAeX is to provide current and potential open scholarship initiatives (journals, publishers, services) with a flexible economic model and a platform to seek and receive funding. It builds on and attempts to scale up the existing no-fee OA models mentioned above (OLH etc.). Its mission is to engage all players in the research and scholarly communication services sphere to not only kick-start but also maintain their diverse projects. Specifically, OAeX offers a tangible route for existing and aspiring OA journal publishers seeking secure and sustainable funding.

'a tangible route for existing and aspiring OA journal publishers seeking secure and sustainable funding'

OAeX envisions doing this through a one-stop online marketplace. This enables funders (mainly libraries and their institutions) to make evidence-based decisions in accordance with their constituents' needs and broader institutional interests. Financial transactions are facilitated through a clearing-house which oversees marketplace activities. This clearing-house provides the added benefit of bundling all essential components – central payment facilitation, transactional transparency, archiving of project-funding bids – within one entity.

OAeX contains the following features as part of a comprehensive economic model for OA services.

- OAeX provides the infrastructure for an online marketplace to serve funders and bidders.

- The market (in the form of funders) decides which services or projects receive investment based on detailed funding bids, thus allowing an element of competition

between journals; this approach is in contrast with the limited choice offered by bundled, big deal, journal collections.

- Multiple funders can converge and share funding for single or multiple bids.

- OAeX acts as a neutral facilitator of transactions between bidders and funders.

- All transactions are open and transparent, allowing funders to take credit for their investments, while also 'nudging' non-funding bodies to participate.

The OAeX model from a funder and bidder perspective appeals to:

- taxpayer arguments for open access[45]

- societal-impact arguments[46]

- open educational practices (OEP)[47]

- positive cultural change[48]

- arguments against pay-to-publish and pay-to-read models.[49]

Importantly, OAeX does not depend on a rapid transformation of funding for scholarly publishing.[50] Instead, it can coexist alongside current funding practices, allowing for steady transitions to no-fee OA as journals and their funders are ready to do so. For example, OAeX can help preprint servers and overlay journals for sciences, while also supporting established society journals in the humanities to flip to no-fee OA on a subscribe-to-open type model.[51]

'OAeX … can coexist alongside current funding practices, allowing for steady transitions to no-fee OA'

Figure 1 below visualizes the place of OAeX within the current ecosystem, whereby OAeX exists in parallel with and complementing existing funding-transaction models and paths to OA.
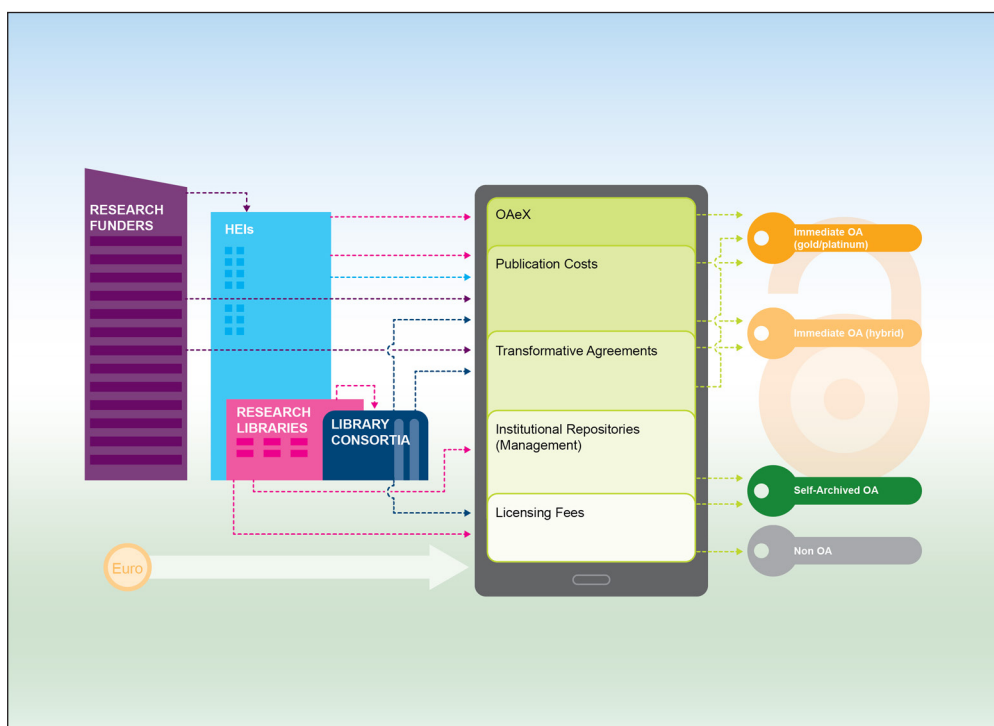

Figure 1. The position of OAeX within the current ecosystem
Illustration by Maria de Maré, used under CC BY licence from the National Library of Sweden. Text modified from original.

OAeX in action: journal publishing

This section describes an instance of OAeX in practice, taking the example of a university press seeking funding to support the operations of a peer-reviewed journal intending to flip to no-fee OA.

Bidding (for funding) in OAeX

Funding bids are prepared and submitted via an OAeX online workflow template, similar to those already used by the Joint Committee for Nordic research councils in the Humanities and Social Sciences.[52] Information relevant to a bid would include the journal's:

- editorial board members

- publisher entity (university press, learned society, commercial publisher etc.)

- current funding model and source(s) of funding

- timescale for required funding (one-off capital funding or operational funding for a fixed/repeat period)

- technical standards supported (Crossref membership, digital preservation strategy etc.)

- sustainability plan (future-proofing measures).

Funding bids are self-administered and posted to the online OAeX marketplace. OAeX operates on a rolling basis, with bids being published and closing continually.

Funding in OAeX

Academic libraries are the traditional funders of journal publications, with expertise in evaluating and selecting publications in collaboration with their faculty. In this sense, libraries are the natural funders targeted by OAeX bidders. However, any public or private actor benefiting from the service can be a potential OAeX funder, including but not limited to research funding bodies. With the ability to reach large groups of private funders, companies and enterprises, OAeX is creating the potential for entirely new sources of funding not available to other models focusing on research institutions.

> 'creating the potential for entirely new sources of funding'

OAeX is designed to make the funding transaction process as straightforward as possible. The marketplace features a cross-searchable database allowing funders (and bidders) to filter bids against descriptive project metadata, such as geographical region, discipline, publisher etc. This enables funders to make evidence-based decisions and allocate funding accordingly. Committed funds are reported in the marketplace in real time. In addition, OAeX ranks funding bids along a financial success scale. This means that funders can choose to favour bids which already attract funding and are likely to meet their target threshold.

A further potential innovation of OAeX is the ability to match bidding projects to funding institutions based on authorship and citation data. Here, OAeX takes inspiration from the no-fee OA journal publisher Sci-Post,[53] which collates the affiliations of its authors and posts lists of the institutions benefiting from it, thus distinguishing between those who fund and those who do not. With OAeX, it may be feasible for bidders to include metadata on authors' and citing authors' affiliations so funders can easily identify bids most relevant to their local interests. Such data would act as a powerful counter to arguments against spending limited institutional resources on shared goods.

Allocating funding in OAeX

For ease of administration, payments are centralized through the OAeX platform. The rationale for this is that multiple, small amounts from various funders committed to different bidders would place the onus of administration on the funder and the bidder, making the model less attractive. Once a funding bid has successfully reached its required funding threshold, OAeX issues a single invoice to each funder, which can cover pledged funding for multiple bids. If less funding than required is attracted, bidders may either abandon their bid or negotiate with already committed funders to seek support for a revised project.

'payments are centralized through the OAeX platform'

Successful bidders enter an agreement with OAeX and commit to administering allocated funds in accordance with their bid, whilst also undertaking to provide openly available reports on their progress in achieving their stated funding goals. The bid's OAeX page contains dated place markers for reporting, which will act as incentives for bidders to comply.

Archiving funding bids

Every funding bid, successful or not, is archived in a central repository for legacy access. This allows funders to take credit for their funding activities: for crowdfunding to take off, it is not sufficient for funders to contribute; they also need to be seen to do so, to promote their contributions and to motivate others to follow suit. Archived funding bids provide a permanent record for accountability, critical analysis and transparency purposes, as well as an information resource for future bidders and funders.

The OAeX workflow summary is described below.

1. The bidder submits a funding bid to the OAeX marketplace.

2. Libraries (as well as other funders) review the bid and decide whether or not to fund.

3. Successful bids are processed by OAeX (invoicing and allocating funds).

4. Successful bidders report to the OAeX marketplace on funding objectives that have been met.

5. OAeX archives all bids (successful and unsuccessful).

6. At the end of the funding period, the cycle repeats for renewed funding.

Administration

An existing library e-resources consortium, of which there are many globally,[54] could act as operator of the OAeX platform. Such consortia possess the expertise and administrative resources to manage centralized transactions between publishers and libraries, so could adapt existing practices to facilitate relationships between bidders and funders.

'operating costs could become self-sustaining by levying a transaction charge with each funding pledge'

In its initial stages, the OAeX host consortium would require seed funding for implementation and establishing sound business practices and representative governance. In the long term, OAeX's operating costs could become self-sustaining by levying a transaction charge with each funding pledge.

The OAeX initiative will require significant advocacy efforts to identify and encourage potential bidders, as well as promote the concept (and marketplace) to potential funders. Promotional activities could be supported by OAeX ambassadors in participating institutions, e.g. librarians and academic colleagues facilitating local engagement and encouraging/advising OA projects to prepare for and submit funding bids.

Sources of funding through OAeX

Libraries may choose to commit to specific journals on an ongoing basis from their annual budget. They could choose to adopt Lewis's suggestion[55] to commit 2.5% of their e-resources budget to OA initiatives. Alternatively, they could use any surplus at the end of their financial year to contribute to one-off OAeX project bids.

Another funding option could be a central and recurring grant allocated to academic libraries by government or funding bodies (possibly from CoalitionS members who have committed to 'collectively establish incentives for establishing Open Access journals/platforms or flipping existing journals to Open Access').[56] Funding bodies could choose to pledge directly via OAeX but might prefer to devolve decision-making to libraries with expertise in evaluating scholarly communications initiatives.

In the years immediately after establishing OAeX – with previously successful bidders returning for new funding cycles and new projects joining in – the amounts of money available in the system will be constrained. While, ideally, libraries would have some capacity to expand commitments (perhaps starting with Lewis's 2.5%[57] followed by incremental increases), budgetary constraints can also be seen as a virtue within the OAeX competitive-market context: limits to funding will ensure only high-quality projects (as judged by funder libraries) are successful. Libraries may choose to gradually increase their OAeX commitment and reduce spend with legacy economic models as circumstances and their strategic priorities evolve.

'helping to incubate and sustain … initiatives as long as it is needed'

OAeX bidders and funders would naturally continue to review the benefits of OAeX and question whether the cost of a middleman is justified. It may be the case that a successful bidder with a small number of funders would indeed be better off managing transactions directly with the funders. This would be in keeping with the aim of OAeX of helping to incubate and sustain such initiatives as long as it is needed and would incentivize OAeX itself to keep its transaction charges low.

Potential Challenges

The OAeX model presents several challenges:

The free rider problem: libraries reluctant to pay for what they can 'get for free'

Besides the prestige and visibility of being publicly acknowledged as an OA supporter, OAeX bidders can offer additional benefits to funders, such as allowing direct participation in governance decisions, à la SCOAP3's Governing Council, which is comprised of paying members.[58] Another motivation is the risk that in the absence of sufficient crowdfunding, a journal could flip back to a more expensive model of either subscriptions or APCs. Existing crowdfunding open scholarship models, as listed above, have demonstrated the willingness of libraries to move beyond supporting local needs and to contribute to a public good.[59] OAeX has the potential to scale this up by making it as easy as possible for bidders and funders to use its services.

'Any publisher … is welcome to engage with OAeX without any commitment or risk'

Publishers concerned about losing revenue from migration to OAeX

Any publisher – for-profit commercial, non-commercial – is welcome to engage with OAeX without any commitment or risk (provided money raised via OAeX is used only for services without reader or author restrictions, i.e. paywalls or APCs). For example, a subscription-based society journal could test the water by bidding for funding in OAeX, but would only flip to no-fee OA after a successful outcome, with the option to convert back to the old model in the event of funders dropping out in future years. As with the example of *Annual Reviews'* subscribe-to-open pilot, new funders outside their existing subscription base could be invited to join, potentially leading to higher revenue. PLOS is currently considering

moving away from APCs to such a 'journal supporter-based model', which could be facilitated via OAeX.[60]

Horizontal scalability to mitigate the risk of a central point of failure

If OAeX is successful and scales up, it is prudent to acknowledge the risk of a central point of failure of its business entity akin to the collapse of the journal subscription agent Swets in 2015.[61] However, this risk can be spread by multiple federated or independent and co-existing OAeX organizations: successful services typically spawn imitators, so multiple OAeXs could compete with each other to ensure continued quality of service and value for the community.

Bidders are concerned about waiting too long for funding

Bidders do not need to seek exclusive funding via OAeX. OAeX can be utilized to supplement other income streams. In this sense, OAeX helps to accelerate transactions when needed or desired. Consider the example of a no-fee OA publisher established with seed funding from a single source: OAeX can assist with long-term viability when initial funding runs out, without forcing the publisher to move to the less advantageous subscription or APC models.

Local funders supporting only local bids

It is possible that bids in OAeX will primarily attract funding from affiliated libraries with knowledge of local projects and their personnel. While this is not necessarily a negative scenario, it may harbour the risk of real or perceived favouritism, or 'populist' pressure to publish what a funding institution would favour. However, the built-in transparency and openness of OAeX can mitigate against this. Indeed, the ability to view and compare many bids within a single platform could prove helpful in transcending local bias.

Future buy-out by a for-profit

The OA community may be concerned about the risk of OAeX being spun out by the host consortium and sold as a means to generate profit, losing its starting motivation (see critique of Bepress being sold to RELX[62] or concerns about KU's for-profit status[63]). OAeX could address this in two very different ways either by emulating the organizational structures of the OLH, which is a registered charity with a defined mission and so cannot be acquired by a for-profit,[64] or by OAeX being agnostic on the for-profit/non-profit issue. As described above, if the model is successful, there may be multiple competing OAeX services, which would mitigate against profiteering or monopolizing by a controlling for-profit. OAeX would not own any intellectual property so dissatisfied bidders or funders could choose to walk away.

Creating OAeX

The authors are in discussion with various individuals and organizations to progress and realize the idea of OAeX and would welcome contact with other interested parties.

Conclusion

Realizing sustainable OA under competitive market conditions represents an ongoing challenge to all participants in scholarly communications: researchers, institutions, funders, publishers, society. Existing transaction models have not achieved sustainable universal access to the scholarly record under conditions that embrace true transparency and equity.

In contrast, the OAeX economic model, as outlined above, represents an amelioration of existing good practice, whilst also offering a measured proposal for collective action.

'the OAeX economic model … represents an amelioration of existing good practice, whilst also offering a measured proposal for collective action'

Abbreviations and Acronyms
A list of the abbreviations and acronyms used in this and other *Insight*s articles can be accessed here – click on the URL below and
then select the 'full list of industry A&As' link: **http://www.uksg.org/publications#aa**.

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