Opinion piece

Classifying Open Access business models

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Abstract

The proliferation of Open Access (OA) business models has been rapid, presenting challenges for stakeholders in academic publishing in communicating and working effectively with one another. This article offers a comprehensive classification system for OA models, categorizing them into five core types (transactional, bundled, cooperative, sponsored, and alternative), each with distinct characteristics and implications for funding, equity, and implementation. This classification aims to clarify the myriad labels and terminologies used, addressing the inconsistencies and gaps in previous attempts to categorize OA models. By providing descriptions and analyses of different business models, the article seeks to enhance transparency around and understanding of OA options, ultimately supporting informed decision-making in the evolving landscape of academic publishing.

Keywords

Business Model; Open Access; Processing Charge; Subscribe to Open; Transformative Deal

A classification system for Open Access business models

Open Access business models have proliferated in recent years. Many publishers offer transformative or transitional agreements, such as those listed in the ESAC Registry (1), while Subscribe to Open (S2O) has grown to the point of gathering a Community of Practice to share experiences with the model (2). There are dozens of other models in operation, all with different brand names – Direct to Open from MIT Press (3), Community Action Publishing from PLOS (4), and Opening the Future (5) all spring to mind.

The challenge for publishers, libraries and funders, not to mention authors, is understanding what these labels actually mean, as well as what the similarities and differences are between the various models. There have been previous attempts to tackle this, but these are either several years old (and thus out of date) (6) (7), or insufficiently comprehensive (8) (9) (10). In this article I expand on the classification system shown in Figure 1, and originally described in the Scholarly Kitchen (11), which collates the various models currently in operation or proposed into five core types plus a supplemental category.

Many of the models described are compliant with Plan S (12), the mandate adopted by a large group of mostly European funders in 2018, which started to apply to monographs from January 2024. As models they also broadly comply with the more recent OSTP memo (13), though implementation of the memo is being left to the different federal agencies and details may vary. I caution, however, that the OSTP memo requires open data as well as open access to published content, and publisher policies on that topic may need revision to meet those requirements.

In the remainder of this article I will describe the characteristics of each category of OA business model, as well as the specific models which fall under each category and some of their more obvious benefits and drawbacks.

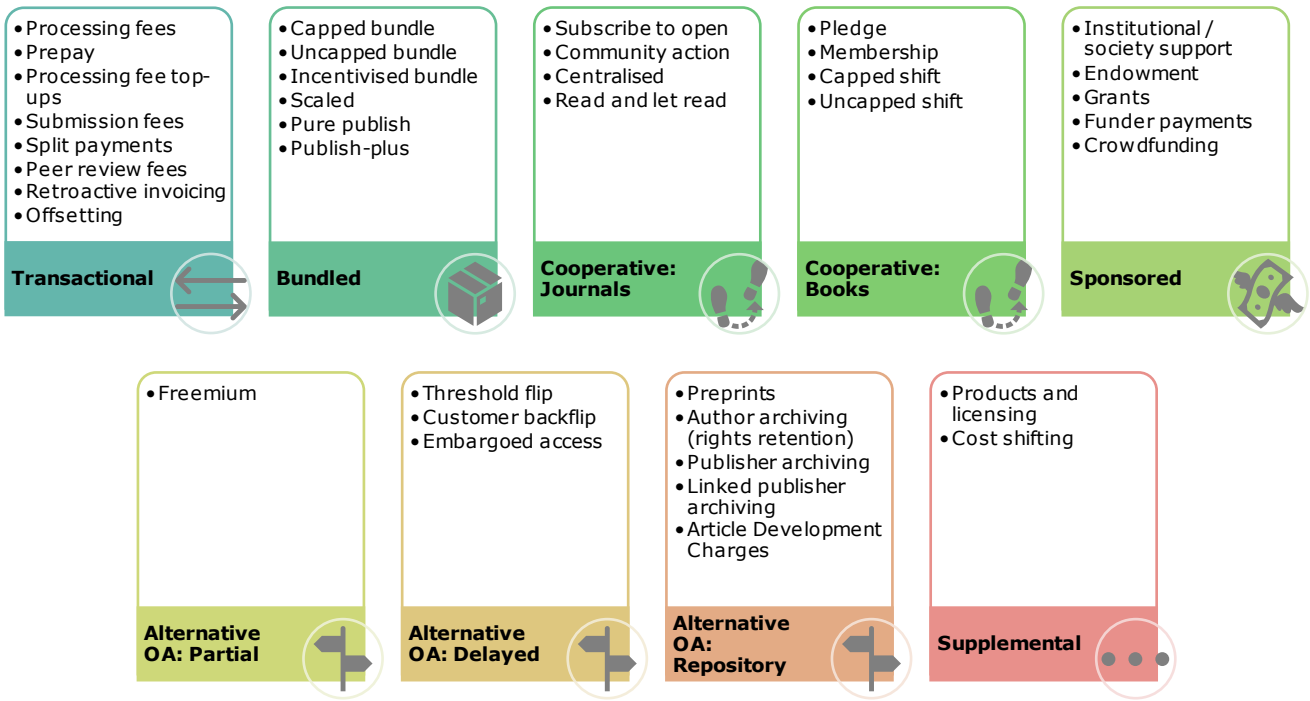

Figure 1. A classification scheme for Open Access business models

A note on terminology

Some terms commonly associated with OA do not appear in my categories or the named models within the categories.

Transitional and transformational

The original bundled deals (badged as Read and Publish) are sometimes labelled as transformative or transitional agreements. As a flip from closed to open can be a goal or feature of any of the business models described below, I do not use the terms transitional or transformational to describe either a business model or a category of models.

Bronze, green, gold and diamond

These terms are used to describe many different OA models, and as such can be unhelpful. For example, while some argue that diamond should only be used to identify models where neither authors nor libraries pay for publication, others have asserted that models without author fees, such as S2O, could also be considered diamond. To avoid this potential for confusion, and to clarify that even where there are neither author nor library fees, publishing costs must be covered, I use 'sponsored' as the classification.

Similarly gold may be used both to identify a journal's operational model (hybrid versus 'gold') and as shorthand for transactional or bundled models. I use OA-only when describing operational models, and avoid describing business models with reference to the metal.

Lastly, bronze and green are often used as a shorthand for some of the alternative OA models. I have elected to use 'embargoed access' for bronze models, while green falls under the repository category.

Category one: transactional models

The transactional category brings together models where publishers levy a fee per item published, and as such they shift costs directly to research producers – that is, institutions which publish more research bear more of the cost, where subscription models aim to spread the same costs across reading as well as publishing institutions. Since the introduction of Article Processing Charges (APCs) in the early days of OA, transactional models have proven to function at scale where publishers have made investments in infrastructure and administration (see the growth of APC-funded publishers like MDPI, Frontiers, and others).

There are very real questions around the equity of transactional models, as not all authors have access to funds and may prefer to dedicate funds to other priorities even if available. This is particularly true among authors from lower-income countries and in poorly funded disciplines such arts and humanities. The problem is exacerbated for highly selective journals such as *Nature*, where the APC for immediate OA was £8890 / $12290 / €10290 at the time of writing (14).

In some quarters there can also be a perception that pay-to-publish transactional models may influence editorial standards in predatory or potentially predatory publishers.

There are four clear-cut transactional models:

- **Processing fees (article, book and chapter):** a fee for publication which takes the place of subscription or other sales revenue. All other transactional models include an element of these processing fees.
- **Prepay**: Prepay accounts encourage institutions or consortia to deposit an amount of money with a publisher (15). Authors from the institution may 'draw down' from the fund to pay processing fees, often at a discounted rate. Prepay accounts can be topped up to permit continued OA publication if the fund becomes low. Alternatively the institution or consortium may decide to close the account and request the return of any remaining funds. Prepay accounts are sometimes badged as memberships, where the account is active for a defined period (often a calendar year) and any funds not used by authors during that time are retained by the publisher.
- **Processing fee top-ups:** in this model a baseline processing fee may be supplemented by fees for additional services, such as fast-track peer review (16), language support, or image recreation.
- **Submission fees**: Reasonably common in economics (17) and business, submission fees can be used in combination with another model to spread the cost burden for journals with high rejection rates, as the costs of rejected articles are partially borne by the authors of those articles. In the context of OA, publishers may offer authors of accepted articles the opportunity to offset their submission fee against another processing fee.

I have classed two further models as transactional, though it could be argued that these sit elsewhere:

- **Split payments**: under this model annual payments from the subscribing institution or consortium are used to cover the costs of access to subscription content and to subsidise the cost of OA. In the agreement between California Digital Library and SpringerNature

(18), for example, the library covers 'at least the first $1,000 of each APC' for corresponding authors, and authors who wish to make their content OA are then required to pay the balance, if any, of the processing fee. It could be argued that split payments should be categorised as a bundled model, but the presence of the author-side fee has led me to include it here.

- **Peer review fees**: in 2022 eLife announced a shift in both editorial and business model. Under the new model any article passing an initial editorial triage (sometimes called pre-screen or desk assessment) is sent for peer review subject to payment of a peer review fee, set at $2000 at the time of writing (19). Articles which are peer reviewed are made available as Reviewed Preprints, with authors given the choice of whether to formally publish a subsequent version of the article as a Version of Record (VOR). This is like the open platforms model listed in the Supplemental category; I have chosen to classify peer review fees as transactional because open platforms are a product rather than a true business model.

There are two final models under the transactional category which no longer appear to be in operation but which are worth noting:

- **Retroactive invoicing**: institutions may opt to receive a single monthly or quarterly invoice for all content published in the period, often at a discounted rate compared with a full processing fee. Authors require permission from the institution to add a transaction to the invoice.
- **Offsetting**: Created by the Royal Society of Chemistry as 'Gold for Gold' (20), this model gives institutions that purchase subscriptions credits that can be used towards transactional fees for OA publication.

Category two: bundled models

While many of the models in this category were built to combine reading and publishing spend, the category incorporates other institutional packages such as pure publish arrangements. A key similarity amongst all bundled models is that they obviate the need for authors to pay transactional fees for publication.

An advantage of these models is that they typically leverage well-established sales routes, either negotiated directly between consortia or institutions and publisher sales teams, or sold (in the case of fixed-price bundles) through sales agents. Equally advantageous is the potential for reduced friction in the author workflow, with some bundled models offering unlimited publishing activity for eligible authors, and others allowing institutional administrators to confirm eligibility without requiring author interaction. These workflows are not always seamless, however, and there is potential both for eligible articles being missed, and thus published behind a paywall, or for authors to still need to intervene to ensure that articles are published OA.

The bundled models combining reading and publishing activity often repurpose existing subscription spend, either in place of or in addition to existing transactional spend, which can be seen as a benefit. Questions remain, however, about their long-term sustainability in the face of pressured library budgets and increasing publishing output – not to mention the withdrawal of Plan S support for such models at the end of 2024 (21). As with transactional models there are also issues around equity, with researchers at well-funded institutions more likely to be covered under the terms of an agreement.

The first models in this category may all be labelled as 'Read and Publish' or 'transformative agreements', but they are distinct in nature, both in terms of the way pricing is typically set and in the author experience:

- **Capped bundles**: capped bundled pricing is typically based on pre-existing subscription payments, whereby libraries pay to maintain subscription access to paywalled content. Overlaid on this read fee is a separately calculated payment for a fixed number of OA articles (or chapters, etc.), usually based on a standard processing fee. The nature of capped deals means that typically authors must seek institutional permission to publish OA under the terms of the deal; where this does not occur OA publication is on a first-come, first-serve basis and there is a risk of the institution exceeding the fixed number of OA articles and having to pay additional processing fees, as happened in the Wiley-Jisc deal in 2020 (22).
- **Uncapped bundles**: pricing is usually based on historic publication trends, with libraries paying to cover the costs of making all their research outputs OA for the duration of the deal for a fixed rate. This all-you-can-eat publication fee is paired with a read fee based on heavily discounted subscription rates (23). For smaller publishers with limited resources these uncapped bundles may be preferable to capped ones owing to their reduced administrative overheads, despite the risk of publishing greater numbers of articles than historic trends may have suggested. These deals do not usually require institutional approval for publication, again reducing administrative demands on the library.
- **Incentivised bundles**: incentivised bundles are based on either capped or uncapped bundles, with the addition or overlay of a non-publishing incentive. The American Physiological Society's 'Read, Publish & Join' (24) model, for example, includes membership of the society for all relevant faculty members or those who engage with society journals as authors or reviewers, while Karger's 'Read, Publish & Outreach' (25) offers extended marketing services such as podcasts or animations. Other incentives could include discounted event registration or institution-specific publishing training.
- **Scaled**: created by the Association for Computing Machinery under the title 'ACM Open' (26), scaled bundled models are based on the publisher's cost base and historic total revenue. Rather than pricing per published article, scaled models use average article publication ranges to place institutions in pricing tiers, with revenue from each tier designed to reflect the proportion of articles. For example, should 10 institutions be collectively responsible for 25% of articles, the tier pricing would set each institution's annual price at 2.5% of the cost base or historic total revenue. Research intensive institutions which publish a lot of content therefore see significant cost increases under this model.

One model is an outlier within the category, as while it bundles all institutional OA spending into a single payment it does not include any read component.

- **Pure publish**: initially created by Gold OA publishers like Frontiers (27) to ensure they were not overlooked in the rush to sign bundled deals, pure publish bundles may be capped or uncapped. They eliminate the read aspect of other bundled models and focus purely on publishing OA content in exchange for a fixed fee. The 'global equity' variant of pure publish, created by PLOS (28), prices institutional deals based on the institution's historical research output in the field and their country's World Bank lending tier. It should be noted that there is nothing to prevent other publishers adopting global equity pricing within other OA business models, and much to recommend it.

One final model sits within this category, which has been under discussion but does not appear to be in current operation:

- **Publish-plus**: institutions are offered the option to add a publication package to their existing subscription at a discounted rate, allowing authors from subscribing institutions to publish OA without transactional fees. As with pure publish or incentivised bundles, both capped and uncapped versions of publish-plus could be available. I suspect these bundles are likely to be of interest to publishers with deep archives all held behind a paywall, where access to the backfiles is of significant value separately from any current publishing activity.

Category three: cooperative models

Cooperative models are extremely varied on the surface, but all rely on cooperative and concerted action from institutions globally. As with bundled models, the lack of author-facing fees in cooperative models is appealing to researchers, as well as offering administrative savings to both publishers and institutions.

S2O (2) is probably the best-known cooperative model, but many book publishers have benefited from cooperative action through other models such as the Knowledge Unlatched 'pledge' system (29). It is entirely feasible to use any of the models described here for either journals or books – for example, the pledge model is classified as book-focused, but it is in operation for journals. The distinction is drawn merely to assist publishers when considering models that could suit their specific needs.

Journal-focused cooperative models

Much like the bundled models, cooperative journal models largely make use of established sales pathways and agents, with the added benefit of not increasing the demand on institutional budgets. However, there are questions about the long-term viability of models that rely on institutions maintaining (or starting new) subscriptions to open content, particularly against the background of increasing pressure on library budgets. To quote Rick Anderson "*Is effectively donating $100,000 a year to a publisher so that the publisher's content can be made freely available the best way for the university to fulfill its mission? Or should the university gamble that it could redirect those funds to other mission-critical programs (scholarships for underrepresented students, lab renovation, that diversity and equity study they've been meaning to do) and be reasonably confident that other institutions will continue supporting the publisher sufficiently to keep the journals open?*" (30).

Having said that, cooperative models have been adopted by an increasingly wide range of publishers since that blog was written in 2021, and I am yet to see evidence of a sustained series of cancellations forcing journals back to paywalled status.

- **Subscribe to open**: many S2O offers are predicated on a discounted subscription price with a requirement for a fixed proportion of existing customers renewing. If the renewal threshold is reached, the content published in that subscription year will be available under OA licences, as is the archive. If the renewal threshold is not reached, the content all remains closed. One of the biggest drawbacks with S2O is the risk, in any given subscription year, of failing to reach the threshold for OA publishing, forcing authors to either pay an unexpected processing fee or publish behind a paywall.
- **Community action**: introduced by PLOS, in these models institutions which publish are asked to cover the costs of the journal plus a small surplus to allow for future investment

(4). Costs are distributed equitably based on corresponding and contributing authors, while articles from authors at institutions that do not participate in the community action model are required to pay a processing fee, which increases year-on-year to encourage participation. With the PLOS model any revenue above the surplus target is used to offset the following year's fees for participants. While community action could be considered a bundle, with the processing fees for non-participating authors a form of top-up, the community-first nature of this model earns it a spot in the cooperative category.

- **Centralised**: the oldest cooperative journal model is probably SCOAP^3 (31), in which CERN acts as a hub for stakeholders who wish to convert particle physics journals to OA. In SCOAP^3, library spend is directed to CERN, which then calculates the proportion of relevant articles in participating titles that come from each country and assesses whether current library spend covers that country's participation or needs to be topped up in some way. If necessary, it liaises with national funders and policymakers about top-up funding. CERN uses the funding pool to pay processing fees for all articles in participating titles, which by default become OA-only journals. In October 2021 SCOAP^3 announced an extension into books in collaboration with OAPEN.

There is one additional model that could be considered under the cooperative heading, but which is not currently in operation:

- **Read and let read**: described by AJ Boston (32), this model proposes that research institutions should pay a publisher a base amount each year according to the number of articles that institution's users had downloaded during the previous year, multiplied by two. This sum forms the base value (Read). Any downloads unclaimed by the institution during the coverage year are donated in the following year to any user on the web (Let Read). The model further supposes a price per article of $0.50. In my view each publisher would need to determine their own financial viability level for the per-article read fee, as $0.50 may well be insufficient to cover costs.

Book-focused cooperative models

OA book models are the subject of intensive assessment at the time of writing, for example through the Open Access Transitions for Book Publishers project being funded by ALPSP, the British Academy, and OASPA (33), and I anticipate that recommendations about cooperative models will be a key outcome of such assessments.

Compared with processing fees, book-focused cooperative models spread the costs of making books OA across a wider network of contributing institutions; in many ways, these models can be compared to subscriptions to book lists. Unlike a subscription, however, participants can elect to support a book-focused cooperative model knowing that the books made OA through this support will remain OA in perpetuity.

Some book models involve third parties in the delivery of OA books:

- **Pledge**: using a central actor to coordinate activity, pledge models pool money from libraries, consortia, corporations, and funders to reach a specific amount of revenue specified by the publisher to convert a title to OA. The Lyrasis Open Access Community Investment Program (OACIP) (34) is a pledge model, as is Knowledge Unlatched. One challenge for publishers working with pledge systems is that these third parties typically have selection committees that decide which titles are eligible for each funding round;

publishers who wish to have more control over which or how many books can be OA may find that another model better suits their needs.

- **Membership**: in this model, supporting institutions pay into a fund which is distributed between participating publishers on an annual basis. Those publishers then provide open content (typically scaled according to the annual revenue), while the coordinating organization charges fees to both publishers and institutions to cover running costs. The Open Library of Humanities is a membership model (35), as is the Open Book Collective (36), though some of their activities are also labelled as subscriptions or supporter programmes.

The second set of models in this category are those where individual publishers own and run their OA activities, without making use of third parties. In contrast to the varied bundled models that all share one name ('Read and Publish'), these models have a multiplicity of names, but like the bundled models they can also be described as either capped or uncapped. Both models typically use tiers to make participation affordable for as many institutions as possible:

- **Capped shifts**: characterised by Opening the Future (5), a monograph-focused model developed by Martin Eve and Frances Pinter, and in place at both Central European University Press and Liverpool University Press, capped shifts ask libraries and consortia to subscribe to a monograph backlist which remains paywalled. The revenue generated by subscriptions is used to fund the publication of new OA monographs, and once the available funds run out, any additional books published in the year are paywalled, thus ensuring continued growth in the paywalled backlist.
- **Uncapped shifts**: like S2O, the Direct to Open model piloted by MIT Press (3) is an uncapped shift model requiring subscribers to maintain their subscriptions to a book list, often at a discounted subscription price. Provided a pre-determined revenue threshold is reached, all books published in that year will be available under OA licences. As with capped shifts the archive remains available only to subscribers. Some of the uncapped shift models make use of aspects of the community action model, where revenue above the financial target is used to offset the following year's fees for participants.

Category four: sponsored models

Broadly speaking this category would meet most of the criteria for 'diamond' OA, in as much as the models in this category involve neither author nor library funding. While originally labelled as 'non-library funding', I adopted the clearer term 'sponsored' from DeltaThink's May 2024 update (37).

Sponsored models have been operating for some time, with differences depending on the actor providing the funding and on the duration for which funding is guaranteed. For example, journals may launch with an initial no-fee period during which the publisher provides funding. eLife, by contrast, had an initial fee-free period covered by the launch funders' contribution of $56 million over 10 years, before introducing fees in 2016 as a supplementary revenue stream (38).

Scielo (39) and Latindex (40), a pair of publishing platforms mostly operating out of South America and across the Spanish-speaking world, are excellent examples of sponsored models. Both platforms make us of funds from a combination of national governments, supra-governmental organisations like UNESCO, research funders, institutions and more, and the initiatives have been running successfully for more than 15 years.

As with the cooperative and bundled models, the lack of author-facing fees is likely very appealing to researchers, and the ability to add 'free' content to their collections without the need to contribute is probably equally appealing to libraries.

For publishers, however, many of the models require significant up-front effort to obtain funding, which may be withdrawn at short notice, meaning that sponsored models raise concerns about long-term financial planning. The first three models also beg questions about control and editorial independence. This is not to suggest that they are problematic – far from it – but simply to raise a note of caution and recommend that publishers consider pursuing multiple sources of funding to ensure financial sustainability.

The first three models tend to offer larger sums of money to support OA publishing, but in some cases funding constraints limit the number of articles or books that may be published in any given year, or the people who are eligible for fee-free publishing. In the latter case, authors who are not eligible for fee-free OA (e.g. authors from outside the institution in the case of institutional support) may be charged a processing fee to cover OA publication, not permitted to publish, or permitted to publish behind a paywall.

- **Institutional or society support**: primarily seen in mission-driven presses such as UCL Press (41), institutional support allows publishers to offer fee-free OA to authors from within the institution with confidence that their operating costs will be covered. Some associations and societies operate similarly, for example UKSG funding their journal *Insights* (42). The American College of Gastroenterology has a partial form of society support for their *Case Reports Journal*, which charges no processing fees for society members and just $500 for non-members (43). While a potentially excellent mechanism for driving society membership numbers, unless membership dues are high they are unlikely to completely cover publishing costs.
- **Endowment**: some corporations and philanthropic bodies have created endowment funds designed to cover specific aspects of a publication programme, though I have found this to be more common among institutions in the US (44) (45) (46) (47). In some cases corporations may badge these funds as corporate social responsibility. Endowments are more financially predictable than institutional support, as they are designed for the long term, but they rarely cover all of the costs of a publishing programme so publishers are advised to seek supplementary revenue streams from the outset.
- **Grant**: another corporate social responsibility option is to donate money in the form of a grant for specific activities. An early example was the BioMed Central Pfizer fund (48), which paid processing fees for authors in countries classified by the World Bank as being low income. While appealing, the ongoing administration and fundraising associated with such grants can make them challenging to operate.

There are two further sponsored models which typically yield smaller sums of money, but that can provide a valuable supplementary revenue stream which, if used carefully, could reduce the costs seen by institutions or authors under another OA business model. In many ways it could be argued that these are not true business models, but they are included for the sake of completeness:

- **Funder payments**: funders have historically paid some transactional fees, though this era may be drawing to a close (49). There is nothing to prevent publishers or indeed institutions from requesting that funders join cooperative models as full participants, or take out a 'top-up' to a bundled model to cover those authors who are subject to the funder's OA mandates but who are not covered by an existing deal. This is appealing

where a specific funder is responsible for a lot of content from a given publisher, particularly where the funder has an OA mandate.

- **Crowdfunding**: where endowments and grants rely on small numbers of organisations donating large sums, crowdfunding is reliant on individual action, usually requesting much smaller sums and acting on a single piece of content at a time. It may be attractive as a route to OA for one-off publications but because crowdfunding brings in variable amounts of money, it has limited potential as a funding model for an entire publisher portfolio. unglue.it is the best example I have come across of true crowdfunding (50), though some cooperative models (e.g. Knowledge Unlatched and Open Library of Humanities) have tried to brand themselves as crowdfunding.

Category five: alternative OA

The more stringent funder mandates, including Plan S, define OA as being 'full and immediate open access to the VOR'. The models in the alternative OA categories do not fulfil both parts of that definition, offering either immediate access to something other than the VOR ('green' OA), or delayed access to the VOR.

Partial models

The only model in this category is one pioneered by the OECD, and it has been the most challenging to position within the categorisation scheme. It could be argued that freemium belongs under the cooperative category, relying as it does on cooperation across participating institutions to ensure that readers can access all materials for free. However, as the free to read components of the freemium model are not the same as full open access for reuse, data mining, etc., I have settled on placing it under alternative OA.

- **Freemium**: the OECD Library is the originator of freemium OA (51), a model that permits anyone to read everything on the platform free of charge, while interaction with the underlying data, downloadable versions, print, text and data mining, and other services are available only to subscribers. Freemium could be a particularly attractive model for publishers releasing content in multiple formats, who could charge for audiobooks, for example, or those publishers with very large underlying data sets who could charge for text and data mining.

Delayed models

Delayed alternative OA models are true business models, in that they either provide a source of revenue or have an impact on the nature of the product being supplied.

Three of the delayed OA models are relatively similar, offering open access to content that could be considered backlist. They may be a sustainable option for some publishers who do not have the resources to institute any of the models in the first four categories, provided they are paired with a funder-compliant repository option to allow authors to make an alternative version of their research available immediately on publication.

- **Embargoed access:** often called 'bronze' OA, under embargoed access publishers make their content freely available after expiry of an embargo. Some publishers will keep content open in perpetuity after expiry of the embargo, whereas others will re-lock content after some years. A good example is the JSTOR embargoed access model, which they call Moving Wall (52). Embargoed access relies on institutions maintaining their subscriptions to the frontlist (i.e. content still under embargo) to fund the open content, so it could be considered the opposite of cooperative models like S2O or capped shift. Despite operating

in some cases for extended periods of time, I have not seen evidence to suggest that embargoed access models lead to subscription attrition.

- **Threshold flip**: developed by Cambridge University Press to open their monographs under the moniker 'Flip It Open' (53), threshold flip defines either a financial target per book or a fixed amount that is guaranteed for all participating books. On initial publication the book is paywalled, becoming open only after the financial threshold is reached. CUP print monographs remain a paid-for service for books that are flipped, providing a supplementary revenue stream, The JSTOR Path to Open model (54) announced in January 2023 is also a threshold flip, though in this case publishers are guaranteed $5000 revenue by JSTOR and all books are made open three years after publication – that is, the threshold is time-based rather than financial.
- **Customer backflip**: piloted by Elsevier in partnership with NERL (55), customer backflip opens up paywalled books or chapters in the publisher's archive that were published by authors from participating institutions. For each year of the deal, five years of previously published books or chapters are made open, which in the case of the Elsevier–NERL deal means that a contract running 2022 to 2024 opened up content published by NERL authors between 1986 and 2000. As with the other models in this category, customer backflip relies on institutions maintaining their subscription holdings in return for a promise of global open access to older content. It could be argued that there is less risk for the publisher in opening older content compared with more recent (e.g. post-2000) material; in exchange, it seems that NERL is paying a lower price than might be anticipated (closer to the original subscription price).

Repository models

This category is where 'green' OA comes in. The models offer authors a route to compliance with their funder and institutional mandates, without requiring a true business model on the part of the publisher.

One repository model offers access to a particularly early version of the scholarly output, and that is preprints. It is my opinion that preprints are an excellent mechanism for offering rapid, frictionless access to scholarship (56), and in addition to recommending that they allow preprints for all submitted articles, I suggest that publishers implement seamless submission from relevant preprint servers to their journals (and vice versa) where this is available.

- **Preprints**: arguably the original route to OA, exemplified by arXiv (57), preprint deposition allows authors to make early versions of their work available for public review and use. While there are arguments both for and against preprints (58) (59), to date I have seen no evidence that preprints reduce authors' appetite for publication in formal venues, nor that they damage publisher revenues. Several funders now mandate preprints in addition to or instead of later archival versions, and many if not most publishers will consider submissions of articles that have already been preprinted (60).

Somewhat later in the process, many OA mandates require authors to make the accepted author manuscripts (AAMs) available under an OA license (60). Repository models around AAMs can be powerful where the publisher cannot – for whatever reason – make the VOR openly available. As noted above they may complement the delayed OA models, but they are also an option for those publishers who simply do not have the capacity to introduce any other route to open.

There are of course arguments to be made against these repository models (that publishers add value during the production process, that institutional repositories are often not optimised for

discoverability beyond the institution, that repositories may not be covered by high-quality preservation services, etc. (61)), but there are just as many arguments in favour of this form of OA (49). Whatever a publisher may think of AAM archiving, given the prevalence of policies requiring it all publishers should have a policy in place to explain their position on such archiving.

- **Author archiving**: while historically many OA mandates permitted publishers to assert an embargo period, more stringent options such as the Rights Retention Strategy (62) require the AAM to be available from the day of publication of the VOR. Some publishers argue that the availability of OA business models, and particularly bundled deals, makes immediate author archiving unnecessary (63), because all authors who could be subject to Rights Retention language *should* be covered by one of their deals, which I think is unclear and confusing messaging for authors who need to comply with a funder mandate but who lack funding for processing fees and who are not covered by another OA model.
- **Publisher archiving**: some institutions and funders have started to ask publishers to immediately archive AAMs in repositories on authors' behalf. This reduces the workload on authors and potentially for institutional repository managers. While repository models can be considered a backstop in the absence of other OA models, publisher archiving can technically challenging even with the availability of services such as Jisc's Publications Router (64), as well as requiring considerable oversight to ensure that all manuscripts are archived in the correct repositories on the correct day. As such, publisher archiving may not be a viable option for publishers who lack resources.

A variant of publisher archiving is a model originally described by John Dove as 'maximum dissemination' (65). John says "*Maximum Dissemination is not intended as an Open Access solution across the board. It was very specifically targeted at the really difficult case: how can successful subscription society publishers in the Humanities and some Social Sciences could achieve Plan S compliance when APCs and Transformative Agreements don't really help.*" (personal communication). In conversation with a client, we agreed the term 'linked publisher archiving' is more descriptive of the model:

- **Linked publisher archiving**: publishers archive all AAMs in on their own sites alongside the VOR; when users from non-subscribing institutions land on the article page, they are presented with both options – to purchase access to the VOR, or to immediately access the AAM free of charge either in the repository or on the article page. The benefit to the publisher is that this model allows them to track usage of the content they have published and assess the comparative value users place on the VOR versus a 'free' AAM. Some CHORUS members appear to operate a version of linked publisher archiving (66).

There is one final repository model which is somewhat of an outlier, as it is associated with a processing fee. As the processing fee results in access to something other than the VOR, however, I have elected to place this model in the repository category:

- **Article Development Charges**: in September 2023, ACS Publications introduced a $2500 fee for authors wanting to follow the author archiving route (67). The fee is payable after editorial triage by authors asserting their rights under the Rights Retention Strategy, making the ADC a hybrid between transactional and repository models. Like a submission fee, or indeed the peer review fees levied by eLife, payment of an ADC does not guarantee acceptance; like a processing fee, payment of the ADC permits immediate OA on the day of publication – though in this case to the AAM rather than the VOR. Authors who choose not to pay the ADC must wait for the publishers' embargo to expire before they are able

to deposit their AAM. There was an extensive explanation of the ADC published on the Scholarly Kitchen in 2023, with associated commentary (68), with one commenter stating that the ADC "*sounds like an attempt to turn Green OA into a form of Gold*".

Supplemental

SPA-OPS identified several opportunities for increasing OA that are not true business models, but rather mechanisms publishers may wish to explore in parallel with developing business models to suit their needs (6). I have included these product and licensing opportunities as well as cost-shifting systems in my classification for completeness.

Products and licensing opportunities could include advertising (69), open research platforms, and OA siblings of subscription journals. Cost shifting, by contrast, would include use of cooperative infrastructures or other forms of cooperative or consortial publishing; cessation of print services to reduce expenditure on print, shipping, warehousing, etc.; closing journals that are not delivering return on investment or reducing book publishing activity; syndication; and outsourcing.

SPA-OPS also identified transformative journal status as an option, but given the announcement of plans to withdraw recognition of this status at the end of 2024 (21) I no longer recommend it to my clients.

These options are classified as supplemental because they still require a business model to generate revenue. Taking an open platform, as an example: these are systems like F1000, in which research is preprinted and publicly peer reviewed before being formally 'published', all on the same platform. However, F1000 still charges APCs (70) – the open platform itself is not a business model. Similarly, publishers who elect to cooperate on infrastructure incur costs without necessarily generating revenues. An example here is the Open Access Switchboard (71), a vital piece of shared infrastructure that streamlines monitoring and reporting between publishers, institutions and funders. What the switchboard monitors and reports on, however, is the publication activity associated with transactional, bundled, cooperative, or sponsored models. In 2023 a new group rebranded cooperative infrastructures and consortial publishing activities as 'Quartz OA', an initiative reliant on a mix of crowdfunding and institutional pledges (72).

Conclusion

There is a plethora of OA business models available, suitable for both books and journals. Selecting a model depends on each publishers' unique circumstances: what they publish, their author base, their institutional customer base, the funders operating within their discipline, and so on. In 2023 NISO approved a working group to develop recommended practices for operationalising OA processes (73), and one part of their brief is to develop a framework for identifying and classifying OA business models. I offer this classification scheme in hopes that it will provide a springboard for their work.

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The author is an independent publishing consultant working primarily with non-profit publishers on their open access transition, and this classification scheme has been developed through her work with clients.

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