

How subscription-based scholarly journals can convert to open access: A review of approaches

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Abstract

This article reviews the ways through which subscription-based scholarly journals have converted to open access. The methodology included a comprehensive literature review of both published and 'grey' literature, such as blog posts and press releases. Eight interviews were also conducted with stakeholders representing different parts of the scholarly publishing landscape. Strategies of conversion for different types of journals are presented at multiple levels (publishers, national, research funders, organizational, and so on). The identified scenarios are split into two main categories, those that rely heavily on article processing charges and those that can operate without relying on author-side financing. Despite there being interesting and important shared traits among many converted journals, individual circumstances largely dictate what options for conversion are viable for a journal. There is no single solution that works for every journal but rather a broad selection of different solutions, among which selection should be well informed.

INTRODUCTION

Until digital distribution became feasible around 1995, charging subscription fees was the most viable option for funding the publication of scholarly journals. Charging subscription fees fared well with the number of copies distributed given the significant per copy expense of printing and physical distribution. The shift to digital distribution changed the economics of publishing to largely 'first copy' costs making it much more feasible to distribute copies of journal articles at no cost and fund publication through other means, which has become known as open access (OA) publishing (BOAI, 2001). In addition to the benefits of unfettered access to the results of scientific studies, OA has been identified as one of the few disruptive mechanisms that could bring significant change to the balance among stakeholders within scholarly publishing.

Pressure for journals to transition from subscriptions to some form of OA business model has been growing and is coming from

many sources, including government and funding agency mandates (White House Blog, 2013), editorial board revolts (Jaschik, 2015), and economic necessity (Daught, 2012). As early as 2004, there was a systematic attempt to evaluate the economic, logistical, and access implications for universities transitioning from subscription to alternative OA funding models (Davis *et al.*, 2004). To date, at least several thousand subscription journals have transitioned to OA publication exclusively, or at least made a digital version of the journal freely available (Solomon, Laakso, & Björk, 2013). It appears that scholarly publishing is in a gradual transition away from subscriptions. It is also clear that the motivations, business models, and circumstances involved in transitioning to OA are unique for each journal.

In April 2015, the Harvard Library's Office for Scholarly Communication released a request for proposals for a comprehensive literature review on methods for converting subscription-based scholarly journals to OA (Harvard Library, 2015). We were fortunate to be awarded the contract to conduct the review. This

Key points

- The circumstances for converting a journal are highly context-sensitive.
- OA conversion can happen incrementally – starting with selected content, time-limited embargoes, or gradually-introduced financial models.
- Society journals have their own set of challenges for a successful conversion.
- Initiating action and support for converting can come from many sources, for example, national governments, a professional publisher, the academic community.
- Going open access should be compatible with the overall goals of the journal.

paper summarizes the project and findings, and the full-length report is available in Solomon, Laakso, and Björk (2016).

METHODOLOGY

The topic of journal conversions is not something that has been well-established and codified within research or practice. The number of OA journals that have converted from subscription-based access has been estimated at nearly 2,400 for the year 2011, which at the time corresponded to over a third of all journals in the Directory of Open Access Journals (Laakso & Björk, 2012). However, only a fraction of the converted journals has made details available about the conversion, which would be immensely helpful for other journals.

In order to obtain as much information about the topic as possible, we opted for a thorough literature review followed by interviews with eight experts with a variety of expertise and perspectives. This section describes the methodology for how data collection was executed.

The literature review was initiated by first consulting the Open Access Directory (OAD) 'Journals that converted from TA to OA' website, which contains a listing of converted journals together with links and other resources that shed light on the various cases of journals going through conversions (Journals that converted from TA to OA, n.d.). The general OA bibliography of the OAD was also reviewed in order to identify relevant materials (Bibliography of open access, n.d.). Scopus was searched for journal articles containing the phrase 'open access'. This generated approximately 3,000 articles that were reviewed, yielding 71 relevant articles that were not already located through the OAD. In addition to these systematic approaches, we conducted web searches with a variety of relevant terms. We also searched for information about journals that we knew had flipped based on our previous research as well as our personal experiences with OA publishing. Lastly, we reviewed

reference lists from the literature we had already obtained for additional relevant content.

In total, we included 190 publications that were organized into four general categories:

- Descriptions/discussions of flipped journals (94 publications).
- Support programmes and descriptions of models for flipping a journal (38 publications).
- How-to guides and recommendations for flipping (26 publications).
- Miscellaneous materials (32 publications).

The full bibliography, with annotations, can be found as an appendix to the full project report (Solomon *et al.*, 2016). Based on the literature review, we identified a set of interviewees who we felt could provide useful information beyond what was contained in the literature. Eight experts were interviewed, with representation from different parts of the scholarly publishing landscape.

Based on the information obtained from the literature review and interviews, we developed a scheme to organize the various scenarios for journals transitioning from subscription to OA. The organizational scheme was continually revised as more evidence was obtained. In order to standardize the data available about each scenario, the following information was constructed to describe each individual scenario: a table describing the characteristics of the scenario, SWOT analysis, description, and example journals.

Shared and differentiating factors among journal conversions

An important component for conducting a bottom-up review like this is separating between characteristics that either differentiate or are shared across converted journals. After familiarizing ourselves with the material to be reviewed, we established four central variables that aided in profiling various conversion scenarios:

- Type of organization that owns and controls the journal.
- Transition mode.
- Funding of the converted journal.
- The online publishing platform.

First, what type of organization owns and controls the journal? For example, is it a society, or is the journal fully owned by a professional publisher? Second, were the transition mode and the conversion to OA direct, that is, set on a specific date, or was it managed more gradually through some intermediate stages? Third, how is the funding of the converted journal envisaged and practically implemented? Lastly, concerning the online publishing platform both prior and after the conversion, is it managed in-house or is it outsourced?

This initial profiling of conversion cases was supplemented by a review of the explicit or implicit goals set up for the conversion that could be derived from the published materials, which were often related to the underlying initial profiling:

- Increase readership.
- Increase citation rates.
- Make advertising and cross-marketing of products and services an additional source of income.
- Increase the number of submissions.
- Achieve financial security and long-term sustainability.
- Stay competitive and profitable.
- Secure additional external funding.
- Increase independence.

One of the intrinsic benefits of OA is increasing readership by removing the financial barrier to access. Research so far has indicated that OA content in journals is read more widely than subscription content (Davis, 2011). An increase in downloads has been found in virtually all studies evaluating the impact of transitioning to OA (Hitchcock, 2013; Swan, 2010; Wagner, 2010). At one end is the altruistic goal of unrestricted openness to research; at the other is a strategy to increase the scientific impact of articles published in the journal, which would make the journal more valuable and influential. For authors, publishing in journals with high citation rates is a path for academic career advancement, thus making highly cited journals more attractive to authors. However, whether or not increased readership from flipping to OA results in higher citation rates is controversial. There are many examples of journals that have seen significant increases in citation rates after flipping to OA (Hitchcock, 2013; Swan, 2010; Wagner, 2010). However, this may be due to additional factors involved in the flip to OA, such as switching to a more prestigious publisher (see e.g. Busch, 2014, which documents impact factor analysis of five journals that flipped to OA using BioMed Central as their OA publisher). Making content available to a wider audience also opens up the possibilities of leveraging the increased page views for additional income for the journal. A subscription journal can assume that it is mostly subscribers who visit its website. However, OA provides unrestricted visibility to published content, which drives web traffic and visitors to the hosting website. This increased visitor count can make advertising and cross-marketing of products and services a source of income that can facilitate transitioning to OA.

Journals commonly aim to increase the number of submissions in order to have a larger selection of articles to consider for publication and thus enhance the reputation of the journal by only publishing higher-quality manuscripts. Subscription-based journals generally limit the number of articles published due to financial constraints. Because the article processing charge (APC) business model scales with the number of publications, there is no artificial limit to the number of articles that can be published. Although there is a short-term incentive to increase publications without regard for quality, such a strategy will eventually backfire, seriously damaging both the reputation of the publisher and the journal (Bohannon, 2016). Reputable OA publishers realize this fact and have just as much motivation to publish sound science as subscription publishers.

For a subscription-based journal with few subscriptions operating at a loss or minimal profit, flipping to OA can be an

opportunity to achieve financial security and long-term sustainability. There are several examples of subscription journals that were on the brink of ceasing publication but have been successful using OA business models (Daught, 2012; Hallberg, 2012). Regardless of whether a publisher is society-based, commercial, or non-profit, increasing revenue can be an incentive for flipping a journal. Depending on the journal, transitioning to OA can either significantly improve or hinder the journal's financial situation. It is important to conduct careful planning and evaluation prior to proceeding with a journal conversion (Jones, 2014). Changing the business model can provide the journal with a new lease on life in addition to the other benefits of OA. Good-quality journals with a narrow scope often have difficulty attracting subscriptions. Because a commercial publisher is likely to see such journals as a burden rather than an asset, it may be quite willing to release such journals from contractual agreements if a society, university, or even an editor is willing to try to save the journal. Flipping to an OA business model can also be a means of staying competitive and profitable. Hindawi started out as a subscription-based publisher but flipped all of its journals to APC-funded OA due to the crowded marketplace created by established major publishers and the difficulty of attracting subscriptions from university libraries whose budgets were already stretched with existing big deals (Peters, 2007). With the significant advantage of being located in Egypt, where there is a talented yet very inexpensive workforce, Hindawi has been able to make the APC-funded OA model a profitable business. Related to financial viability, flipping a journal to OA can be an opportunity to secure additional external funding, either to sustain the journal while allowing an opportunity to lower or avoid the need for APCs or to achieve a more liberal waiver policy. Some national journal subsidies are only eligible for journals publishing their content OA; as such, this is an incentive for subscription-based journals, where eligible for such subsidies, to transition to OA. Securing subsidies is, in most cases, not a primary aim of the conversion. More often, stakeholders want to transition to OA for a number of other primary reasons, and the public subsidies is a facilitator that helps make an OA business model feasible.

Flipping to OA often occurs in conjunction with changes in the publishing arrangements of a journal – switching publishers, perhaps transferring to a low-cost OA publisher, or going from a collaboration with a professional publisher to self-published. While there may be a number of motivations for such changes in publishing arrangements, increasing independence in journal operations can be an important goal. An extreme case of independence seeking can be seen when the core editorial board decides to move from one journal to another due to disagreements with the publisher of the journal. In cases where the journal's publisher actively resists or does not provide a satisfactory OA option to an editorial board that strongly prefers an OA model, the only option might be for the editorial board to 'declare independence' (Journal Declarations of Independence, n.d.). This has entailed members of an editorial board resigning from the original journal and founding a new OA journal, which is either self-published or partners with a publisher that will publish the

journal OA. This, however, necessitates the founding of a new journal, which is somewhat different than flipping an existing journal and raises new challenges (Jaschik, 2015).

Conversion facilitators

From the literature review and expert interviews, a number of factors were identified that have facilitated the decision to convert or even facilitated the process of converting to OA itself:

- Stakeholder pressure.
- Monetary subsidies.
- Maintaining a paper subscription version to subsidize freely available online content.

First, important stakeholders may exert pressure on the journal owners or managers to flip. In particular, such pressure may come externally from governments, ministries of education, or research funders, for whom the term influence is perhaps better because OA mandates are not targeted to individual journals. Authors, readers, reviewers, and the editorial board of the journal can also create pressure for the journal to convert to OA. In addition, there may be monetary subsidies available to facilitate the conversion process. Such subsidies can be in the form of specific funds available to aid the conversion during a limited time, so-called 'bridge funding', as is the case in Austria (Reckling & Scherag, 2013), or subsidies can be embedded in the rules of the continuous grants given in many countries, often to journals in the social sciences and humanities. Finally, maintaining a paper subscription version to subsidize freely available online content is one option to help fund a conversion to OA. Journals that choose this model tend to be society-based, with fairly low subscription fees.

Table 1 summarizes the scenarios for converting journals identified through the literature review and expert interviews, categorized into two categories based on the degree of reliance on APCs to finance the individual scenarios. Although neatly compartmentalized in Table 1, it is not rare that individual journal conversions implement elements from one or many of these scenarios simultaneously. The element of APC-based funding can play either a small or an influential role in most of the scenarios; the split here is based on the general tendencies of observed journal conversions. The identified scenarios placed in each category are summarized in the following two main sections.

APC-funded journal conversion scenarios

Reversing the business model from reader-pays to author-pays represents a literal 'flip' of the traditional journal publishing model. We identified variations in how journals have adopted APC funding as part of a conversion to OA publishing, which are summarized in this section and are split into three subsections. The first subsection presents general scenarios, while the second subsection focuses on scenarios that have so far been implemented as part of a more gradual conversion process. The third and

last subsection focuses on the scenarios, particularly on the publisher relationship.

General conversion scenarios:

- Submission fees in addition to or instead of APCs.
- Bundling APCs with subscription licenses (offset deals).
- Rebranding and modifying the scope of the journal or spinning-off a specified section of a journal.

Some journals have incorporated submission fees in addition to or instead of APCs in order to finance OA publishing. Submission fees require author-side payment for all manuscripts submitted to the journal and can be used by journals either alone or in conjunction with APC payment for manuscripts accepted for publication. Submission fees typically range from 50 USD to 200 USD (Ware, 2010). Similar to providing subsidies for APCs, societies and associations might also provide members with a discount or waive the submission fee [e.g. the American Anthropology Association with their first converted journal *Cultural Anthropology*, which has a submission fee of 21 USD for non-members (Elfenbein, 2014)]. Submission fees appear most appropriate for journals with high rejection rates, where the cost associated with reviewing manuscripts that are eventually rejected is quite high. To impose fees can discourage submissions even when set fairly low, but all the while, the transaction costs for collecting these fees can be quite high. As such, submission fees can be argued to be of questionable value in funding journals transitioning from subscription to OA.

Bundling APCs with subscription licenses (also known as 'offsetting') is an emerging practice of including APC waivers or discount agreements as part of institutional subscription deals with large publishers. Institutions and their affiliated authors are increasingly pressured by research funders and national governments to publish research OA, and publishers are increasing their hybrid OA and full OA journal offerings. This is mostly a publisher-level scenario, not something that individual journals can influence, but it has trickle-down effects on the quantity and quality of submissions that APC-based journals receive and how a publisher might decide which journals to flip. There is no wealth of publicly available information about the specific details outlined in deals that universities or libraries have made with journal publishers because the contracts usually contain requirements for non-disclosure. What can be concluded based on the scarce information available is that Springer has been one of the pioneering publishers in making offset deals. Springer has made such arrangements with the Max Planck Society and university consortiums from the UK, the Netherlands, Sweden, and Austria (including the Austrian Science Fund) (Springer, 2016). These agreements enable authors from affiliated institutions to publish their articles OA in all of Springer's hybrid OA journals. Wiley has also been active in providing offset deals as part of subscription negotiations. Jisc, who negotiates publisher agreements on behalf of UK universities and libraries, has disclosed some details about their deal with Wiley, which spans from 2015 to 2017;

TABLE 1 Overview of identified journal conversion scenarios, categorized based on the degree of reliance on article processing charges (APCs) for financing the scenario.

APC-funded scenarios	Non-APC-funded scenarios
<ul style="list-style-type: none"> ● Submission fees in addition to or instead of APCs 	<ul style="list-style-type: none"> ● Society subsidy
<ul style="list-style-type: none"> ● Changing focus and services during the conversion <ul style="list-style-type: none"> ○ Rebranding/re-scoping journal ○ Spinning-off a section of a journal 	<ul style="list-style-type: none"> ● Low cost infrastructure and volunteer effort ● Joining regional journal platform
<ul style="list-style-type: none"> ● Gradual conversion scenarios <ul style="list-style-type: none"> ○ Through hybrid OA ○ Bundling APCs with subscription licenses ○ Through delayed OA 	<ul style="list-style-type: none"> ● Joining consortium or library partnership subsidy ● Other non-APC sources of funding
<ul style="list-style-type: none"> ● Same or new publisher after the conversion <ul style="list-style-type: none"> ○ Staying with the same publisher ○ Switching to a different publisher ○ Partnering with a low-cost external publisher ○ Partnering with global major publisher 	

universities get credit that is usable for APCs based on what they spent on subscriptions in the previous year (Jisc, 2014). The most recent major development in offset deals was the outcome of negotiations between Elsevier and the Association of Universities in the Netherlands (VSNU), who reached an initial offsetting agreement in December 2015 – under a month from the previous subscription agreement running out (VSNU, 2015). This was the first time (at least noted publicly) that Elsevier agreed to an off-setting scheme as part of a subscription agreement; however, specific details remain undisclosed. A selection of Elsevier's journals will be made available for VSNU-affiliated authors to publish in OA, with the offsetting gradually expanding to cover 30% of all OA articles published in 2017.

It is not uncommon that a journal changes focus as part of converting to OA publishing, either by rebranding and modifying the scope of the journal or spinning-off a specified section of a journal. By increasing the scope of the journal in conjunction with flipping them, the journal can be repositioned in the market to cater to a higher flow of submissions. While adjustments to journal scope and objectives can occur at any time, this scenario is concerned with major changes, which may extend to changing the journal's name. Major changes enable smaller, regional subscription journals to broaden their readership and authorship and potentially raise their citations and status. While this strategy can be successful, the journal runs the risk of losing its local base of support, and their current author pool may not be able or willing to pay the APC (Solomon and Björk 2012). While spinning-off a well-defined section of an existing subscription-based journal and publishing it as a separate OA journal contains the central element of founding a completely new journal, the whole process shares elements of transitioning an existing journal to OA. Depending on the circumstances, the spin-off scenario can also act as a stepping stone towards fully transitioning a journal to an OA publishing model. As a practical example of rebranding, in 2015, de Gruyter flipped, renamed, and rebranded eight STM subscription journals previously published by Springer (De Gruyter, 2014a, 2014b). A

recent spin-off example is Applications in Plant Sciences, whose first issue was published in 2013 as part of BioOne's OA collection. The journal originates from an online-only section in the American Journal of Botany (BSA, 2016).

Gradual conversion scenarios:

- Converting through hybrid OA.
- Converting through delayed OA.

Instead of approaching conversion to OA as an instantaneous 'flip', gradual conversion through hybrid OA has been used by some journals. From the start, hybrid OA has been marketed by many publishers as an 'experiment'. Prosser (2003) outlined the strategy for this experiment in a seminal article. Although a number of publishers offered a hybrid option on a small scale, starting around 1996, Springer was the first major publisher to offer the hybrid option on a large scale in 2004 at a uniform fee of 3,000 USD (Björk, 2012). Other major publishers began adding a hybrid option on a smaller scale. Starting around 2009, the number of journals offering a hybrid option increased dramatically. Most followed Springer's lead, pricing their hybrid APCs in the 3,000 USD range. Elsevier has been the one major exception, pricing their hybrid journals individually (Björk & Solomon, 2014). For the hybrid-to-full APC funding option to be a viable strategy, APCs must be set close to the level necessary to generate the income the journal needs to operate. For-profit publishers would also need to generate a reasonable profit. This goal should be feasible for many journals. Journals that currently have a high percentage of subscriptions from non-academic institutions, such as some clinically oriented medical journals, might require an unrealistically high APC to generate similar income to what they currently receive from subscriptions (Sutton, 2015). Although it may be possible to generate enough income to cover the cost of publication, it would be difficult to convince publishers to give up the profits these journals receive from subscriptions outside of academia.

Journals have also gradually converted through delayed OA. Delayed OA is a practice where a subscription-access journal makes all articles freely available after a fixed period of time. The embargo time varies from journal to journal but is usually between 6 and 24 months (Laakso & Björk, 2013). Delayed OA can serve as a stepping stone, allowing a society or other organization publishing a subscription journal to achieve some of the benefits and assess some of the risks of transitioning their journal or journals to a full OA business model. *Nucleic Acids Research* is a high-impact STM journal from Oxford University Press (OUP), with strong author loyalty. OUP implemented a 6-month delayed OA for several years prior to a successful transition to a full OA journal in 2005 funded by APC sales of institutional memberships and substantial residual subscription income (Bird, 2008, 2010). The Association for Research in Vision and Ophthalmology has announced that it will transition their journal *Investigative Ophthalmology and Visual Science* to APC-funded OA beginning in 2016 (Yorio, 2015). This is another example of a journal that had implemented a short, 6-month delayed OA policy before transitioning to full APC-funded OA.

Scenarios with focus on the publisher relationship:

- Staying with the same publisher.
- Switching publishers when flipping to OA.
 - Partnering with a low-cost professional publisher.
 - Partnering with a major commercial publisher.

From our literature review and expert interviews, the journal-publisher relationship was an aspect that often played an integral part in the journal flip to OA. We identified two variations to a scenario defined by the trait of a journal staying with the same publisher before and after the conversion. In the first, the journal is owned by the publisher (commercial, university, or large society press). In the second, a society contracts with an external publisher for their publishing services. In both cases, pressure from the academic community in question, particularly the editors and editorial boards, can be a decisive factor influencing the conversion (Corsín Jiménez, Boyer, Hartigan & de la Cadena 2015). For a large publisher, the conversion cannot be viewed in isolation from the overall journal portfolio and the business strategy. These publishers have typically converted individual journals in order to start experimenting with OA and the APC model or have sought a more lucrative business model for established journals with modest subscription income (Jones, 2014). The motivations of small societies are somewhat different. Often, the journal in question is the only journal owned by the society. In cases of societies from regions that are not well-represented by English-language journals, there might be a strong ideological element of support from authors within the region, but these societies may feel that they can gain international recognition and expand readership by converting their journal to OA. There are numerous journals that have converted to OA while retaining the same publisher they utilized prior to converting; some prominent well-documented examples include *Nucleic Acids Research* (Oxford University Press) (Bird, 2008), *Stem Cell Research* (Elsevier) (Boersma, 2013), and *Conservation Letters* (Wiley) (Lalasz, 2014).

It is quite common for journals to switch publishers when flipping to OA publishing; strained publisher relationships can act as a trigger for journals to seek a publishing arrangement that is more in line with what the journal editorial community is seeking. For example, a society may want to outsource publishing activities that have previously been performed in-house or switch from one professional publisher to another. One common situation is transitioning from a traditionally subscription-based publisher to a publisher that uses an APC-funded OA model for most or all of its journals. It is also possible for a society to switch from a subscription-based publisher to a low-cost self-publishing model using society resources and volunteer effort. Re-evaluating and renegotiating the publishing arrangement can facilitate a well-planned transition from a subscription to OA publishing. Changing to a publisher with more extensive experience in OA publishing is likely to be beneficial for the future success of the journal (Busch, 2014). Changing publishers allows a society or other journal owners to revisit the conditions under which the journal is published. Issues such as digital rights and licensing can be renegotiated to be more consistent with OA.

A transition from one publishing system to another often requires a significant change in workflow, which can be very disruptive, expensive, and time consuming. Negotiating access to previously published content can be challenging, and if the right to the content can be obtained, making it available can be expensive and labour-intensive. An extensive marketing campaign will likely be needed to inform readers and authors about the changes in the journal and avoid confusion. Changing to a well-established and reputable publisher with a professional marketing strategy can improve the reputation of a journal and increase submissions and citations (Busch, 2014; Goldman, 2012). A new publisher with a seasoned staff and journal management system geared towards an OA business model can streamline the production process and work with the editorial board to improve the operation of the journal. Changing both the business model and the publisher used by a journal is a major shift with potentially serious financial consequences and can invoke confusion or even active resistance among the author community or society.

Reducing costs can be just as effective as generating additional income. Cost reduction through partnering with a low-cost professional publisher can greatly assist small societies and other organizations with a few journals and without the technical resources to publish their journals on their own. There is a growing number of options for journals seeking a low-cost publisher, providing a variety of options with different pricing and levels of service. The vast majority of societies and other non-profits that publish journals publish on a very small scale. Of society publishers, 90% publish a single journal, and 97% publish three or fewer journals (Crow, 2006), often lacking the economy of scale to publish their journals efficiently. A number of relatively new OA publishers have focused on providing efficient and cost-effective publishing services, generally partnering with societies, universities, and other organizations to publish low-cost OA journals. The publishing services provided vary with each publisher but generally include web hosting for the journal and providing web-based

journal management support for peer review and other publishing tasks, such as assigning digital object identifiers (DOIs). They also generally provide permanent archiving and backup support. In some cases, when they do not provide a specific service a journal needs, they can serve as the ‘middle man’ for obtaining services, such as copy editing, from another company.

We could also discern a scenario that primarily concerns Asian journals that have partnered with major commercial publishers as part of flipping to an OA publishing model. These journals tend to be English-language journals indexed in the Web of Science and within the STM disciplines. This scenario could, in theory, be used in other areas of the world but, to date, has generally been used primarily in Asia. This scenario includes both journals that require an APC (e.g. *Annals of Occupational and Environmental Medicine*, aoemj.biomedcentral.com) and journals that do not (e.g. *Petroleum Science* 2016; link.springer.com, 2016). These kinds of partnerships are not something exclusive to the OA model of publishing and also occur for journals that remain subscription-based (Lin & Zhan, 2016). The scenario has been used successfully in a number of Asian countries that have been industrializing very quickly and are developing strong research infrastructures but whose journals, to date, have lacked the international stature of the top Western European and North American journals. This scenario offers one approach to achieving that goal.

Non-APC-funded scenarios

Many journals flip to OA without implementing APCs. We identified two main strategies for this:

- Society or institutional subsidy.
- Cost reductions through voluntary labour and low-cost infrastructure.

Society subsidies are where the parent association or society uses income from other sources to flip a journal to OA to avoid requiring an APC from authors. A society can form a publication partnership with a professional publisher, or the society itself can publish the journal. Societies offer good infrastructure (such as governance and recurrent conferences) for opportunities to discuss the issue of flipping. To what extent are members willing to pay higher dues and conference fees or give up services provided by the organization to make their journals open? Often, there is a very committed and vocal minority pushing to transition the society’s journals to OA, but it may not be as much of an issue for the majority of members, who will often resist sacrifices needed to transition journals. If a society publishes multiple journals, the income from the other journals might be used to subsidize the flipped journal. Surveys can be a very useful tool in gauging the membership’s attitudes and expectations in making these important decisions. The impact a journal has on the society’s finances also varies. If subscriptions are bringing in significant income, the flip to a subsidized OA publishing model has a large influence on the funding structure of the journal – if not also the whole society. Examples of journals that converted to OA and utilize society subsidies to avoid APC requirement are *New Zealand Journal of*

Forestry Science (nzjforestryscience.springeropen.com, now part of SpringerOpen) and *Chiropractic and Manual Therapies* (chiromt.biomedcentral.com, now published by BMC).

Journals with very little or no means of funding for professional publishing services can seek to replace funding by adopting a low-cost infrastructure and volunteer effort. This scenario is common for journals that were created OA, but there are examples of journals that have transitioned from subscription-based to a very low-cost OA publishing model. This method provides a means of flipping journals from subscription to OA in disciplines or situations where it is very difficult to obtain support through APCs or other means. Volunteers can lower the overall cost of funding publication. Student labour can be used for publishing, which can benefit both the students and the journal if managed properly. However, publishing requires specialized skills, and it can be difficult to find people with the desired skills who are willing to donate their time. Due to these limitations, this model is applicable mainly to low-volume journals, at least until operations can scale up to the point that some part of the process be handled by paid-for assistance. Minimizing costs through volunteer effort, open source journal management software such as OJS, and in-kind support from universities or other organizations are viable approaches to publishing a low-volume journal. Volunteer journals are also usually heavily reliant on one or several key scholars, and should they suddenly abandon the journal for whatever reason, the risk that the journal simply becomes discontinued is high. That is why it would be important to have contingency plans and resources available for unexpected events. An example of a journal running largely on volunteer effort and the OJS platform is *Anthropology and Aging*, which first converted to an online version in 2012 with support from the University of Pittsburgh’s University Library System (ULS). The Association for Anthropology and Gerontology (AAGE) was able to host the journal online and eventually convert it to OA (Danely, 2014).

We also identified some complementary non-APC income streams for supporting the publication of an OA journal. A curated list of journals implementing these models can be found on the OAD page dedicated to journal business models (OA journal business models, n.d.).

- Advertisements.
- Fund raising or crowd funding.
- Added value editions.

Placing advertisements on the journal website is a convenient means of generating some additional income to help cover the cost of publishing an OA journal. Using services like Google AdSense requires little effort beyond setting up the journal website for use of the service, although advertising space may also be sold directly to an advertiser in order to have more control over advertising content. Advertising should be strategically placed to clearly differentiate between editorial content and paid-for content and, preferably, manually curated to minimize the risk of inappropriate ads being displayed. Fund raising or crowd funding can provide another source of income. These methods are likely

more appropriate for covering the one-time costs of flipping a journal to OA than for covering the ongoing costs of publishing the journal once OA. Seeking donations for creating an endowment, although very challenging, has the advantage of providing some level of funding for operating the journal indefinitely. Added value editions can serve as a means of generating funding for operating an OA journal. For example, subscriptions to the paper version of the journal can cover the costs of operating the journal, allowing the digital version to be OA. Another option is to make the HTML version of the articles OA while charging a fee for access to the PDF version. It may also be possible to sell formatted paper reprints for specific articles that help defray the costs of providing the digital version of the articles OA.

Becoming part of a larger OA infrastructure

- Joining a regional publishing platform.
- Joining a consortium or library partnership subsidy.

Depending on which country the journal is based in, an existing subscription-based print journal might be able to join a regional publishing platform and provide OA to the web version of the journal that way. Since about 2000, there has been development in regional and national publishing portals that provide the basic infrastructure for digital publishing. This phenomenon has mainly occurred outside of North America and Western Europe. Probably the best known is the successful Latin America-based SciELO, but there are many others in Eastern Europe, Asia, and Africa. Most of the journals are small and published by societies or universities. These portals often have some level of national public funding or international donor funding (see e.g. INASP, 2016). Frequently, these portals use OJS rather than proprietary software. On a global scale, using regional and national portals as enablers for conversion to OA without the need for APCs has been extremely popular, with the number of converted journals in the thousands, with SciELO alone hosting over 1,200 journals (SciELO, 2016). In some countries and regions, such portals have been very successful. Regional publishing platforms, where available, have often been the natural choice for print subscription journals considering a digital OA version.

Journal flipping can be funded by a journal joining a consortium or library partnership subsidy. Commonly, multiple journals are flipped and supported as part of a single consortium agreement because the larger scale is beneficial to membership and publication outlets. Optimally, the funds directed to covering journal publication activities would be taken from funds that libraries previously allocated to pay for journal subscriptions, thus avoiding a substantial extra cost. The more members, the less that has to be paid per member, so attracting new members should be easier once critical mass has been achieved. SCOAP3 and the Open Library of Humanities (OLH) are the most prominent successful initiatives so far. To date, the successful consortium approaches have focused on specific disciplines and have been primarily driven by non-profit or non-commercial organizations. Freeing included journals from the reliance on collecting

individually paid APCs brings increased stability and predictability. A potential complication unique to the scenario is the governance structure once the number of member organizations grows into the hundreds and beyond. Arranging for democratic decision making on potential new journals to be included in the consortium and the pricing of membership for different types and sizes of organizations can be challenging. Free-riding is also a potential problem; that is, an organization can resign from the consortium, or decline to join, and still has full access to read and publish in all included OA journals. Furthermore, libraries might not be incentivized to become members if it does not cut overall spending; that is, it does not affect the costs paid for subscriptions and APCs but is an additional cost on top of everything else. As noted by Crow (2006), while the consortium model has many attractive aspects, there are significant challenges involved in implementing such a model.

SUMMARY AND CONCLUSIONS

In the 1990s and early 2000s, most conversions were by journals published by scholarly societies or university departments, journals which, at the time of conversion, were only publishing print versions. These journals then opted not to charge subscription fees for access to their electronic versions. In many cases, such journals benefited from national or regional portals like SciELO and later on from open source software such as OJS. In some cases, journals partnered with dedicated OA publishers, especially in biomedicine (Busch, 2014). Eventually, large commercial publishers, university presses, and leading scholarly societies could no longer ignore OA. OA publishers like BMC and PLOS laid the groundwork by pioneering the APC mode of funding OA journals, and major publishers like OUP started to experiment with the conversion of individual journals. In parallel, Springer started to offer the hybrid approach to vast numbers of journals. Many hybrid OA publishers have marketed their hybrid approach as a path towards full OA. However, there are only isolated examples of journals that have converted through the hybrid path.

In the last few years, the large publishers have started to convert their journals to OA (Research Information, 2015; Wolters Kluwer, 2014; Wright, 2011). Often, societies have outsourced their journals to these publishers, and the pressure to convert can come from the societies themselves. However, in some cases, major publishers have flipped journals they own (Bourke, 2014). Societies may also choose to partner with a new type of low-cost publisher like Ubiquity Press.

In a few areas of science, conversions have come about in a different way. The SCOAP3 project in high-energy physics is a remarkable example of how large research institutes and universities, which traditionally have provided the bulk of subscription revenue, have been able to force many of the core journals in their field to convert to OA (Bianco *et al.*, 2007). The OLH represents a promising, more flexible approach in the humanities, where a large number of university libraries and research funders

can pool their resources to publish journals that do not charge author fees (OLH, 2015).

In many European countries, centralized government research funders have traditionally provided subsidies to national scholarly journals with the aim of supporting research in a local language or with a regional content. Such journals, especially in the social sciences and humanities, are prime targets for conversions. Therefore, the rules to receive subsidies are important instruments for steering journals towards conversion. There are good examples from countries like Canada (Haggerty, 2008) and Norway (Lund & Lie, 2014) for how this can be accomplished. Recent developments in a few European countries have raised concerns over the lack of transparency that may be the result of increasingly complex bilateral agreements between big publishers and umbrella library organizations representing whole nations like the UK and the Netherlands (Crotty, 2016; de Leeuwe, 2016).

Morrison (2016) recently interviewed participants involved in producing small scholar-led journals that either are or would like to convert to OA. For most journals, a transition to OA contains a great deal of uncertainty with regards to the financial aspects, but editorial staff support and foreseen community response were also issues perceived to inhibit a transition to OA (Morrison, 2016). To facilitate conversions of journals, both large and small, we would like to encourage more transparent case studies to be published concerning journal conversions, particularly offering a longitudinal perspective of the impact of OA on various metrics and editorial experiences.

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