The open access movement began alongside the wide scale adoption of the Internet in the 1990s, and it has continued to gain momentum through the efforts of research organization and university advocates aiming to make peer-reviewed research freely available to anyone who needs it. Still, the vast majority of academic journal literature remains locked behind paywalls and is only accessible through expensive subscriptions most often paid for by academic libraries. This paper investigates the extent to which a growing number of academic libraries offering not-for-profit open access publishing services can impact systemic, transformative changes to a largely commercial, for-profit publishing industry. Through establishing and maintaining publishing services—including open access journal hosting and institutional repositories—I argue that academic libraries in Canada and beyond can reposition and empower themselves as not only subscribers and lenders of online scholarly resources, but also as producers of the information their users need. However, I argue further that this can only be accomplished through careful consideration and implementation of sustainable, cost-efficient allocation of resources.

The Call to Open Up Academic Publishing

Each year in North America, billions of tax payer dollars are given to granting agencies and universities by governments in order to fuel research and innovation (Boroush, 2013; Canadian Association of University Teachers, 2013). Academics put this money towards research projects that result in findings disseminated through peer-reviewed journals. In turn, libraries subscribe to

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these journals to make these research findings available to students and faculty members to inform their studies, instruction, and scholarship. This is a well-established system that has thrived for decades, largely facilitated by a select number of commercial scientific publishers, namely Elsevier, Springer, Taylor & Francis, Sage, and John Wiley & Sons (Alexander, 2014). The problem with this situation is two-fold. First of all, commercial publishers control a monopoly over publicly funded academic research output, turning it into a commodity that is mainly accessible to those affiliated with universities and research organizations that are able to afford it. Second of all, the publishers running this industry have amassed increasingly high profits for their products, straining libraries’ ability to provide users with what they need to conduct academic work (see Baveye, 2010; Khabsa & Giles, 2014; Morrison, 2014b; Suber, 2012; Van Noorden, 2013).

From the commercial publisher’s perspective, these revenues drive innovation and ensure sustainability. In a 2012 interview, Alicia Wise, Director of Universal Access for Elsevier, pointed out that commercial publishers are able to provide long-term, financial stability in an otherwise unpredictable environment within higher education. Furthermore, these publishers invest in creating and marketing new journals where there is emerging demand; they develop new technological platforms to facilitate discovery of research and improve researcher productivity (e.g., Scopus, CrossRef); and through an economy of scale they efficiently carry out tasks like copyediting and proofreading to ultimately supply customers with the highest quality of information possible (Poynder, 2012). Indeed, it is important to not underestimate the time, money, and resources required to produce an academic journal. However, in 2013, Elsevier reported profits of €2,126 million, with an adjusted operating profit of €826 million (Reed Elsevier, 2013). As pointed out by Heather Morrison (2014a), Assistant Professor at the University of Ottawa’s School of Information Studies and long-time open access advocate, this equates to a profit margin of 39%. She suggests that the library budgets feeding these profits could surely be spent more wisely, and she is not alone in thinking this way: people all over the world have been actively seeking alternative, cost effective ways of disseminating academic research findings for more than a decade.

Led by academics, students, librarians, funding agencies, governments, and others, the open access movement has resulted in a prolific number of freely available open access journals across disciplines. The Directory of Open Access Journals (or DOAJ, available at http://doaj.org) lists 10,039 to date, a number that has doubled over the last five years (Bernstein Research, 2014), and that includes 265 journals actively being produced in Canada. While many of these journals fail to boast high impact factors, a questionably flawed measure of a journal’s worth based on how frequently articles it publishes are cited (see for instance Alberts, 2012; Lozano, Larivière, & Gingras, 2012), they do promise
heightened value by virtue of being available to anyone, anytime, freely online. In addition to open access journals, OpenDOAR, or the Directory of Open Access Repositories (http://opendoar.org), lists more than 2600 institutional repositories worldwide, 64 of which are in Canada. These online, digital archives—typically run by libraries—provide access to archived research output including peer-reviewed articles (where the author has maintained copyright), datasets, theses, and technical reports.

One of the driving forces behind making research available through the production of open access journals and repositories has been mandates adopted by research funders, universities, and governments. A wide variety of newly emerged policies require academics and, in some cases research grant recipients, to make the products of their research available through archiving the peer-reviewed versions of their works online in institutional repositories, or by publishing their findings in open access journals, or both. Such mandates have been adopted by institutions and organizations worldwide including Harvard, Massachusetts Institute of Technology (MIT), the National Institute of Health, Wellcome Trust, the Chinese Academy of Sciences (CAS), and the European Research Council (many more are listed in the Registry of Open Access Repositories Mandatory Archiving Policies at http://roarmap.eprints.org). In Canada, the Canadian Institutes for Health Research (CIHR) instituted an open access policy in 2013 requiring that research it funds be made available through either a repository or a publisher’s website within twelve months (Canadian Institutes of Health Research, 2013). Additionally, an open access policy announcement similar to that of the CIHR is expected from the Tri-Council Agencies (comprised of the CIHR, the Natural Sciences and Engineering Research Council of Canada [NSERC], and the Social Sciences and Humanities Research Council of Canada [SSHRC]) in fall 2014 (Natural Sciences and Engineering Research Council of Canada, 2014).

As research funders and institutions have begun mandating open access, large commercial publishing companies like Elsevier, Wiley, and Springer have gotten on board by producing open access journals that charge author processing fees as a means of remaining both sustainable and profitable. Elsevier currently publishes 118 open access journals, while another 1600 offer open access options in addition to subscription content (otherwise known as ‘hybrid’ open access journals); open access author fees for these journals range anywhere from $500-$5000 USD (Elsevier, 2014). Meanwhile, Springer charges $3000 USD to publish articles with unrestricted access (Springer, 2014), and Wiley charges anywhere from $1500-$3000 USD depending on the journal (Wiley, 2014). Non-profit open access publishers have also adopted author processing charges as a means of sustaining operations, including the Public Library of Science, which charges between $1350-$2900 USD per article (Public Library of Science, 2014). In fact, approximately thirty percent of all open access
journals indexed in the DOAJ charge some form of a fee to publish an author’s work and make it openly available (Suber, 2013).

It would be difficult for academics to come up with this type of money each time they wished to publish. To this end, the term “author processing charge” is misleading. A comprehensive 2009 study of scientists’ experiences with open access around the world found that only 12% of researchers had paid publishing fees out of pocket, while 59% used money from research funds, and 24% used university funds (Dallmeier-Tiessen et. al., 2011). In Canada specifically, there are at least 14 university open access funds, which are provided by academic research libraries (Canadian Association of Research Libraries, 2014). As an increasing amount of research is required to go in to open access venues, and as more academics hear the calls from the open access movement to make their works more openly available, libraries offering these funds may ultimately find their budgets stretched even further through paying publishers author fees for open access content while also paying for journal subscriptions (Bernstein Research, 2014). While the potential benefits and drawbacks of author funds have yet to be fully realized, this does raise questions as to where academic libraries might best leverage institutional investments to support and enable open access moving forward. In what follows, I suggest that locally managed library publishing operations reveal an emerging area for libraries to start focusing more attention and resources as a means of providing access to academic literature, and potentially, significantly transforming the current commercial publishing industry for the betterment of academia and society.

Libraries as Transformative Players in the Open Access Movement

A recent economic analysis carried out by Bernstein Research (2014) concluded that the open access movement proves no threat to leading subscription publishers because it lacks a clear focus and provides no clear solutions. The report alleges that there are too many diverse calls for open access (by academics wanting their works cited, librarians wanting costs to go down, and activists wanting broader overall access to publicly funded works), and that “this lack of clarity on which problem OA is trying to solve, in turn, means that it is difficult to achieve any of these goals” (p. 10). What the report fails to recognize, however, is that the common objective shared by each of these groups is straightforward and unified: affordable, discoverable, sustainable publishing models for the dissemination of academic scholarship. Additionally, the report fails to acknowledge that academic libraries, the ones currently providing the primary source of revenue for these large publishers, are among those leading the way in implementing open access alternatives. Recent open access publishing models hold much potential for lowering library costs for resources, ensuring higher discoverability—and therefore higher
citation rates—of academic works, and providing free access to publicly funded research findings to anyone in the world with an Internet connection.

Literature on the open access movement has largely cast libraries as made up of staff cheering on the sidelines, while publishers, authors, governments, and funding agencies are the major players making it happen. Portrayals of library involvement have focused on the role of librarians as advocates within their professional spheres: there to help students and faculty better understand the issues at play and make educated decisions about where to disseminate their own works, and access the works of others (see for instance Laakso, Welling, Bukvova, Nyman, & Björk, & Hedlund, 2011; Palmer, Dill, & Christie, 2009; Cryer & Collins, 2011; Thiede, 2014). At the same time, however, academics and students have turned to the library for technical assistance and staffing for experiments with digital scholarship over the last two decades; this supportive role has increasingly become formalized, morphing into full-fledged publishing services in both small and large universities, thus placing libraries in the forefront of open access knowledge production (as outlined in Hahn, 2008; Lippincott, Skinner, & Watkinson, 2014).

Socio-technical transformations theory (STT) is useful for understanding this scenario where libraries are gaining prominence as open access publishers, and envisioning a potential future for this emerging service area. STT “is focused on understanding trajectories of socio-economic development and practical interventions to re-orient systems towards sustainable pathways” (Riddell, 2013, p.138). It looks at how ‘socio-technical regimes’ built by the co-evolution and interdependence of institutions and technologies become highly resistant to change. It then investigates how these regimes might be transformed through grand discourses around more sustainable, alternative structures to those currently in place. Over time, niche alternative practices are envisioned and advanced, opening up new structures within current contexts; these new structures, in tandem with further new and emerging novel approaches, can create spaces for transformation (Fuenfschilling & Truffer, 2014; Grin, Rotman, & Schot, 2010; Riddell, 2013). This type of change requires the players involved, in this case, librarians, academics, and university administrators, to look beyond current structures, and actively imagine, explore, contribute to, support, and build alternative, more sustainable practices and perspectives, and then strategize, negotiate, and improve upon results as they unfold. Against the backdrop of open access mandates currently in place, and with lessons learned from early experimentation with digital scholarship to currently active, thriving open access journals run by established publishers, the potential for library publishing services to emerge as a transformative, sustainable, and dominant practice holds much momentum. As I will discuss in the following section, there are already numerous libraries that are engaged in library publishing, which is proving to be both affordable and effective through the support of university
administrators, scholars, and librarians working hand-in-hand. However, these services are not without challenges that still need to be overcome for library publishing to become a sustainable, mainstream practice, and compete with current commercial publishing operations.

Library Publishing in Action

In 2013, the Library Publishing Coalition was launched, made up of 60 North American academic libraries working together to share knowledge, collaborate, and develop common practices (Lippincott et. al., 2014). Recently, they released a directory of detailed information on 115 library publishers producing 391 faculty-driven journals (Library Publishing Coalition, 2014). Of those listed, most reported using Open Journal Systems (OJS), open source journal publishing software that was originally developed in Canada by the Public Knowledge Project. OJS helps facilitate every step of the academic publishing process from submission to peer-review to copy-editing and publication. According to the OJS website, there are at least 24,000 users of the software worldwide, and at least 7,021 journals actively producing 10 or more articles each year (Public Knowledge Project, 2014). Other options include Digital Commons, which is available to libraries that use this product for hosting an institutional repository and costs approximately $20,000 annually (Poynder, 2014), and Scholastica, which currently charges a $10 per-article processing fee or $5 for law reviews (Scholastica, 2014).

Considering the costs involved, for libraries that have the technical infrastructure to support locally hosted digital content, an open source software publishing product like OJS provides a flexible and sustainable solution for library publishing. However, it does require technical expertise to perform tasks such as installation of the software, running updates, investigating technical glitches that may arise, integrating digital preservation strategies, and making any aesthetic changes to the rather limited out-of-the-box design elements that the software comes with. One helping hand for this type of work is the open source community of users who, in the spirit of openness, tend to share code on sites like GitHub (https://github.com), and engage with other user in online forums to come up with solutions to problems as they arise while also building upon software functionality. It is, however, also imperative for an academic library to have a strong team of information technology specialists in-house to help these projects along. It can be a lot of work initially, but with the right supports in place, products like OJS, as well as open source institutional repository software products like Fedora and DSpace, have proven to be a viable option in many Canadian university libraries and around the world. Furthermore, some libraries offer journal hosting for others who do not have the technological supports to run the installation at their institutions, including the
University of Alberta (Betkowski, 2014), and consortia initiatives are emerging whereby a group of libraries come together to support a shared network of institutional repositories (see for instance the CAUL - CBUA Atlantic Islandora Repository Network project at http://www.cairnrepo.org).

Apart from technical requirements and supports, open access journals and institutional repositories need people to do the actual work of helping content creators put content online. In library publishing, this is all too often an understaffed enterprise facilitated by a single librarian acting as both a repository and journal software manager working alongside a part-time library staff member or graduate student, as outlined in a majority of entries in the Library Publishing Directory (Library Publishing Coalition, 2014). Library publishing services require staff to work with and for scholars to perform a variety of tasks to ensure end results are of academic and enduring quality. These tasks can include software training, DOI assignment, ISSN registration, assigning metadata, reviewing analytics, performing outreach and promotion, assisting with digitization and video/audio streaming, giving copyright advice, ensuring long-term digital preservation, and providing support for processes such as copy-editing and peer-review management (Lippincott et. al., 2014). Failing to fully support any one of these processes threatens the credibility of an institution and the academics involved in its publishing initiatives, as well as limiting the discoverability and use of the work produced. There are already far too many open access journals online that are entirely lacking in quality and credibility (see Beale, 2014). In response, the DOAJ has begun imposing stringent quality standards upon the publishers it indexes by implementing a detailed application form, and a seal of approval for journals that meet set criteria around best practices in open access publishing (Directory of Open Access Journals, 2014). It is incumbent upon library publishers to strive to meet these quality standards if they are to ensure that the services they offer are worthwhile and sustainable. A number of libraries have taken strides in this direction by developing Memorandums of Understanding signed by journal managers and library publishing service providers that outline the roles and responsibilities of each party to ensure an ongoing quality product, including the University of Victoria (http://journals.uvic.ca/journalinfo/Memorandum_Understanding.pdf) and Dalhousie University (http://dal.ca.libguides.com/ojs_getting_started). An additional, necessary requirement to ensure quality and sustainability, however, is sufficient staffing and skill development to support these services and all of the necessary tasks outlined above.

Institutional repositories present their own set of challenges in addition to requiring adequate staffing and resources for technical support and the day-to-day management of content. Copyright restrictions and low faculty uptake present significant barriers to the viability of these initiatives, and the benefits they can bring to current publishing practices that restrict access to research.
As outlined in Dorothea Salo’s article “Innkeeper at the roach motel” (2008), repositories have done a poor job of attracting faculty members, particularly when those faculty are expected to contribute works themselves. Meanwhile, many publishers—including Wiley, Springer, and Elsevier—will only allow author accepted manuscript to be archived and not the final copy-edited version of a work. This creates confusion around version control (e.g., what is and is not peer-reviewed) when works are discovered in repositories, or more frequently, in research indexes like Google Scholar, and does not appeal to faculty members who want the best-quality, copy-edited, professional version of their works available to other academics. There are ways around these barriers, however. First of all, with adequate staffing, repository staff can go through faculty CVs, annual reports (if available), and research indexes like Scopus and Google Scholar to identify works by faculty members at their institutions that can be archived, and then deposit these works on the faculty members behalf. In addition to publisher’s websites, a service out of Norfolk University in the UK called SHERPA RoMEO (http://www.sherpa.ac.uk/romeo) makes it relatively easy to look up brief summaries of journal archiving policies. Additionally, institutional mandates like the one created by Concordia University in 2010 (https://library.concordia.ca/research/openaccess/SenateResolutiononOpenAccess.pdf) can help facilitate collecting works for repositories further by requiring that faculty members deposit published works within 12 months of publication.

To assist with version control, there is a practical workaround that has been adopted by users of Digital Commons, and can be integrated into other repository software functions (or done manually). This is the practice of creating cover pages for author accepted manuscripts explaining whether the work is or is not a peer-reviewed version, along with providing a complete citation and link to the publisher’s version (which is information that many publishers already require be included with archived works anyway). This makes it clear to a researcher who may happen upon a work in an index like Google Scholar what version they are looking at, while also drawing attention to where they can obtain the official version of record if they wish to do so. Another creative way that repositories are being adapted to be as “open as possible” in light of copyright restrictions is the use of a “request a copy from the author” button researchers can use to email the author directly (Sale, Couture, Rodrigues, Carr, & Harnad, 2010). Using this method, the metadata for academic works can still be listed in open access repositories, and anyone can still conceivably obtain a copy; they just need to request it directly from the author, a practice that is allowed under fair dealing in Canadian copyright law.

As I have outlined in the examples above, current library publishing processes have the means of providing digital access to academic literature through both open access journals and repositories, but these processes can only be furthered, improved upon, and strengthened with adequate resources,
appropriate software, and sufficient staffing. To this end, Morrison suggests that “there is more than enough money in the budgets of academic libraries to fund a fully open access scholarly journal publishing system” (2014a, para. 1). Borrowing from an analysis by Morrison (2014a) applying slightly more recent figures, according to the *STM Report: An overview of scientific and scholarly journal publishing* (Ware and Mabe, 2012), libraries contributed approximately 68-75% of the $9.4 billion USD revenues major scientific, technical, and medical publishers took in for 2011. An analysis of a variety of publishers reveals that those published in journals using OJS are the least expensive to produce at approximately $188 per article (see Edgar & Wilinksy, 2010 as cited in Morrison, 2014a). If one were to multiply this amount by the number of scholarly articles published per year at approximately 1.8 million (Ware & Mabe, 2012), then it would work out to a total cost of $338.4 million, which is significantly less than the 9.4 billion USD in publisher revenues cited above (which, it should be noted, amounts to each article costing approximately $5000 USD). With this knowledge in hand, it is unlikely that libraries will unanimously cancel all current subscriptions with for-profit publishers and dive headlong into the business of publishing journals in-house to create a more affordable open access publishing system. However, this breakdown of costs does draw attention to the inherent value brought about by affordable, niche alternative publishing practices that are underway in libraries, and that can bear significant impact upon current publishing structures through production that is focused on the needs of scholars and the public rather than on those of profit-seeking investors (Morrison, 2014a).

**Conclusion**

A recent study published in *PLoS ONE* estimated that 27 million, or 24%, of the 114 million English-language scholarly documents available through Google Scholar and Microsoft Academic Search are freely available on the web (Khabsa & Giles, 2014). While this is not nearly as much as open access advocates would like, it shows a significant step in the right direction. Though the authors of this study fail to acknowledge the sources of this free information, it can be surmised that library publishing initiatives—including open access journals and institutional repositories—have contributed greatly. For these initiatives to remain viable and grow to potentially compete with and transform the dominant, closed-access means through which much scholarship is communicated, however, it is important for library publishers to demonstrate value over time. Both administrators and scholars need to see library publishing as a strategic and purposeful service area that is valuable and contributing positively to the current publishing ecosystem in order to warrant involvement, support, and funding. This can be accomplished through giving
careful consideration to best practices that are currently being established, built upon, and shared by libraries already engaged in thriving publishing services (see for instance Hahn, 2008; Crow, Ivins, Mower, Nesdill, Newton, Speer, & Watkinson, 2012; Brown, 2014). Furthermore, ongoing viability requires the implementation of sustainable and cost-efficient allocation of existing resources towards software and staffing that can support a successful publishing program. It is not enough to simply install publishing or repository software, make it available to scholars, and trust that these services will take care of themselves with minimal support. Adequate, skilled staff and appropriate software can provide the foundations for library publishing services that serve to produce and make information available rather than restrict access to a select few, which is, after all, at the core of what libraries do.

REFERENCES


