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# Primary Rights and the Inequalities of E-Book Access

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## **Primary Rights and the Inequalities of E-Book Access**

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#### Abstract

The e-book landscape is in a constant state of flux. More recent developments include new acquisition models, advances in platform usability and navigation, more lenient DRM provisions, and improvements to simultaneous user access licenses. However, what has not been addressed recently are the inequalities in e-book access for libraries across the world due to primary rights. Territorial rights versus world rights is a licensing issue affecting libraries globally, and yet little is being done to address the inequalities of access. Join our discussion that will examine the "unavailable in your country" message libraries often see alongside e-book purchase options, review documented inflation and deflation in e-book prices over time, and learn about the delayed or limited e-book offerings for global libraries.

Explore how we can ensure equal access to electronic books for libraries across the globe. Hear perspectives from libraries inside and outside of the United States, as well as publisher thoughts on the topic, including the continued drawbacks for library e-book access they believe will continue. Where do these discussions need to occur and who can we educate on the importance of including international access clauses in licenses or publishing agreements? Although this issue may not be widely known by librarians in the United States, the exclusivity of electronic content based on the geographical location or status of a country is a sharp contrast to many of the inherent beliefs that are foundational to our profession.

#### Introduction

The equal access to published content is an underlying pillar of libraries and librarianship. Regardless of format, language, or subject, the expectation of libraries is to offer accessible and diverse content. The changing landscape of the electronic book (e-book) market has caused libraries to take more diverse approaches to collection development, including new acquisition models, platform changes and migrations, less rigid digital rights management (DRM), and improved user access licenses. However, what has been omitted from this progress are the inequalities that persist for global libraries to equally access e-book content due to publisher-author rights. More specifically, "publishing contracts often divide rights into 'primary rights' and 'subsidiary rights'" (Cabrera, Ostroff, & Schofield, 2015, p. 28). These rights restrictions are leaving many countries frustrated and questioning why so many titles include "unavailable in your country" notes, while other countries face few barriers to purchasing e-books.

#### **Research Background**

Definitions of publishing and author rights have evolved over time, and more recent examples have

been included in legal guides. In 2011, Guthrie stated that primary rights were "the right to publish and distribute an English-language book in an anglophone territory(ies)" (p. 130). Only a few years later Cabrera et al. (2015) shared their views that common primary rights, granted to publishers, include print rights, digital and/or electronic rights, and more, while Magagula and Oberholster (2015) stated primary rights are "the right to publish the book normally in print and electronic format." Although different interpretations of primary rights seem to exist, it is clear that they center around the basic right to distribute, including which territories, countries, and geographic areas those might cover. Some publishers have been known to share a list of geographic areas the author(s) can select for distribution, and those to exclude (Guthrie, 2011). In contrast to this, one publisher (A. Jarvis, personal communication, September 18, 2019), shared that their practice was solely to ask for world rights and that any alternatives were only because authors requested certain distribution restrictions.

Cabrera et al. (2015) go on to define common subsidiary rights as including the right to incorporate content into an anthology or other work, the right to publish the book's other editions, translation

rights, audio rights, performance rights, and others. Furthermore, they share that if the rights are not explicitly stated in the license or contract, it is likely an author may still hold those rights. Primary rights, including exclusive rights, can be transferable; an author can assign rights to another person or company, and it seems common practice has been for publishers to acquire exclusive rights during the negotiation process (Schroff, 2019). Schroff (2019) explains that authors retain recognition as the creator, but the commercial intermediary or publisher gets to decide how the copyright is applied and therefore how the work is monetized. Schroff (2019) points to the extensive economic resources now required for a work to reach its full potential due to the range of ways for a title to now be monetized, including publishing in alternate formats. Most individual authors do not have the necessary expertise or capital to reach every segment of today's market, and therefore a partner or commercial intermediary, such as a publisher, literary agent, or producer, are now almost always required for an author to get the best deal (Schroff, 2019).

Digital rights pose a new challenge for both authors and publishers, particularly when titles are first published in print format. Cabrera et al. (2015) note that more recent publishing contracts will often outline print, electronic, and digital rights, and typically those rights will fall to the publisher unless the author negotiates separating those rights and withholding certain rights. With the growth of digital publishing, publishers are less willing to give authors electronic and digital rights to their works (Cabrera et al., 2015). In general, DRM can be separated into three areas: assets (information content), rights (primary, subsidiary), and parties (author, publisher vendors, end users) (lannella, 2002). lannella (2002) argues that authors need to preserve or negotiate more layers of rights to ensure their titles can be more widely available; by signing complete rights to publishers, authors lose control as to where or how that content will be published. Additionally, authors need to be made aware of the challenges they pose to libraries, a large market segment, when leaving out negotiations around electronic format or geographic area restrictions.

Similar to growing pains that the music industry had gone through, the publishing industry is suffering from many of the same challenges faced years ago. The digital revolution has allowed music to become more transportable and easier to access, with the traditional music industry evolving to better meet

the needs of its creators, producers, and consumers (Hadida & Paris, 2014). Finding an alternative model to delivering online music content has allowed the industry to continue to grow, after a time when music piracy caused great upset and fear for the future (International Federation of the Phonographic Industry [IFPI], 2015, as cited in Wlömert & Papies, 2016). Wlömert and Papies (2016) estimate that the overall effect of streaming on industry revenue has been positive, both in terms of access for consumers and revenue for creators. The publishing industry has an opportunity to evolve in a similar fashion. We are living in a world of global e-commerce, therefore the format of a book and geographic restrictions associated with it should be irrelevant. The format of a book is insignificant, as the content of the information asset does not change whether delivered in print or electronically. Therefore, the format of a published title should not be treated as a separate subsidiary right.

An academic library outside of Canada provided an excellent example of this reasoning when they sent an image of the title African Theatre 17: Contemporary Dance (C. Dean, personal communication, October 11, 2019). The back cover of the book includes a statement, "Paperback for sale in Africa only." Clearly a geographic publishing restriction was assigned to this print book. This title was then searched in a library acquisitions platform (LAP) in Canada, and although it was listed, no purchase options were indicated. The title was then searched through Amazon.ca, and not only could the Canadian library purchase the title, it was coming from a UK distributor and the library would have had the benefit of paying in Canadian dollars. The significance of this example is that in a world that can now largely rely on e-commerce, are geographic publishing restrictions still rational?

Furthermore, feedback from a university press representative indicated that these subsidiary rights restrictions, including the rights to represent a work in a variety of formats, are actually more necessary than ever in order to protect the rights of creators (T. Sanfilippo, personal communication, May 23, 2019). Using comic book publishing as an example, restrictive rights transfers are a common practice, and authors tend to benefit from restrictions, but publishers do not (T. Sanfilippo, personal communication, May 23, 2019). Many comic creators choose to only grant exclusive licenses for print publication to have the ability to later adapt their strips into a book collection, a translated edition, to allow for a

movie remake, or even a television show based on the book. Without retaining some of these rights, creators lose the ability to generate revenue from their original content. Ohio State University Press maintains they have only been successful at acquiring some big-name authors and titles by allowing authors to retain rights to the e-book format, those same rights libraries need lifted in order to provide wider access to users (T. Sanfilippo, personal communication, May 23, 2019).

#### **Availability of Titles**

This investigation began as a way to shed light on the issue affecting Canada and specifically Canadian academic libraries, but it quickly became of larger international importance. In Canada, the implications for the acquisition of e-books extends to title-by-title selection, titles included in evidence-based acquisition (EBA) packages, and demand-driven acquisition (DDA) titles, as well as implications for accessing local faculty publications. In order to assess the issue from an international perspective, 13 libraries from around the world were asked to contribute their local availability of a specific list of titles. Figure 1

indicates availability of titles for purchase in electronic format across eight different countries.

The wide range of access across countries does not seem to be affected by a country's status, the author's or title's country of origin, or the year of publication. The one commonality across countries was the unavailability of textbook titles by four major publishers, Pearson, John Wiley & Sons, Nelson, and Macmillan. Textbook titles by these publishers largely remained unavailable across all countries, or the title's cost made it unrealistic to acquire.

Understanding the publishing and acquisitions workflow is also a key part of this discussion. Figure 2 illustrates a common workflow authors go through to negotiate the rights to their manuscripts. This process does not look the same for every publisher, as many have limited distribution globally due to office locations, as well as jurisdictional limitations on copyright. As an example, the *Harry Potter* series was first published by Bloomsbury in England, but Scholastic owned the U.S. distribution rights (Galligan, 2004). Years after the print publication of the *Harry Potter* series, the British distributor OverDrive came

Title	Canada	United States	South Africa	England	Scotland	Ireland	Wales	Netherlands
NINE LIVES OF CHARLOTTE TAYLOR	N	γ	N	N	N	N	γ	Y (LAP2)
BECKER'S WORLD OF THE CELL, GLOBAL EDITION	N	N	Y (LAP1)	Y (LAP1)	Y (LAP1)	Y (LAP1)	N	Y (LAP1)
CONCISE BOOK OF MUSCLES	N	γ	γ	Y (LAP2)	Y (LAP2)	γ	γ	Y (LAP2)
ELEMENTS OF JOURNALISM: WHAT NEWSPEOPLE SHOUL	N	γ	N	N	N	N	Y (LAP2)	Y (LAP2)
ELEMENTS OF THE NATURE AND PROPERTIES OF SOILS	N	N	Y (LAP1)	Y (LAP1)	Y (LAP1)	Y (LAP1)	N	Y (LAP1)
ENVIRONMENT: THE SCIENCE BEHIND THE STORIES: GLOB	N	N	Y (LAP1)	Y (LAP1)	Y (LAP1)	Y (LAP1)	N	Y (LAP1)
HOW FASCISM WORKS: THE POLITICS OF US AND THEM	N	γ	γ	Y (LAP2)	Y (LAP2)	γ	Y (LAP2)	Y (LAP2)
LAST TABOO: A SURVIVAL GUIDE TO MENTAL HEALTH CA	N	N	γ	Y (LAP2)	Y (LAP2)	γ	Y (LAP2)	Y (LAP2)
QUICK AND NIMBLE: LESSONS FROM LEADING CEOS ON I	N	N	N	Y (LAP1)	N	N	N	N
TEMPEST	N	γ	γ	Y (LAP2)	Y (LAP2)	γ	Y (LAP2)	Y (LAP2)
WOMEN TALKING: A NOVEL	N	γ	N	Y (LAP1)	N	N	N	N
FOUNDATIONS OF FINANCIAL MANAGEMENT.	N	N	N	Y (LAP1 >\$1200)	N	N	N	N
HUMAN GEOGRAPHY: PEOPLE, PLACE, AND CULTURE	N	N	N	Y (LAP1>\$1400)	N	N	Y (LAP2 >\$1200)	N
ELECTRONIC COMMERCE	N	N	N	Y (LAP1>\$1000)	N	N	N	Y (LAP1 >\$800
INTRODUCTION TO INFORMATION SYSTEMS: SUPPORTIN	N	N	N	Y (LAP1 >\$1000)	N	N	Y (LAP2 >\$805)	N
LAP1 & LAP2 Indicates Library Acquisitions Platform 1 or Library Acquisitions Platform 2								

Figure 1. Availability of titles by country, outlining selected e-book titles that are unavailable for libraries to purchase in Canada, as well as the availability of those titles for libraries to purchase in other countries around the world.



Figure 2. Author-publisher rights negotiation workflow, illustrating the general steps taken in rights and distribution negotiations for new books.

to an exclusive deal with Pottermore, the online distributor of *Harry Potter* merchandise, in order to distribute the *Harry Potter* books in electronic format to school and public libraries worldwide (Kenneally, 2012). It was not until long after the original print book series was published that electronic rights were granted, and even then, the rights were negotiated through J. K. Rowling's literary agent and came with specific licensing terms, such as library platform exclusivity (Galligan, 2004). Ultimately, titles are released to certain countries, and these decisions

may lie with the publisher, the author, or the rights of that country.

Upon publication of a title, content becomes available to most academic libraries through library acquisitions platforms (LAPs). LAPs exist to allow libraries to easily and efficiently order books from different providers and publishers, in both print and electronic format. Examples of LAPs include YBP's GOBI or ProQuest's Oasis. The inclusion of content in LAPs is an automated task, as seen in Figure 3. Data is auto-ingested from providers via content feeds. Metadata about each item is included in these feeds and contains information for describing individual titles, as well as acquisitions data such as the price and availability. It is this automatically ingested content that includes country and format availability information. As the feeds are coming from the same providers across the globe, territorial rights restrictions and availability information are not filtered from data imports. As content is coming from third parties, vendor representatives at senior levels of those organizations who negotiate for worldwide rights are not communicating to clients about the challenges, or country restrictions are an unknown area for teams negotiating rights and access to content on their proprietary LAPs. Those negotiating at higher levels within organizations need to understand the implications for their clients when global e-book rights are left out of the negotiation discussion. Some vendor representatives even seem unaware of distinct pricing differences between titles, as well as different access models of titles in their own LAPs.



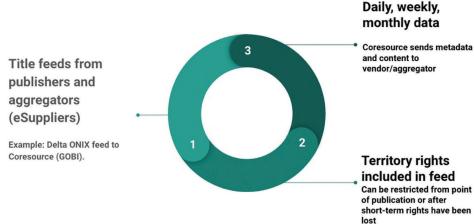


Figure 3. Library acquisitions platform (LAP) data ingest process, demonstrating the basic steps that make up the ingest process for data into LAPs.

### **General Cases of Unavailability**

There were a number of different scenarios that were found to result in cases of unavailability for libraries. In some circumstances, certain countries had electronic access to content from one LAP, but not another, or the same title was completely unavailable in one country but available on all LAPs for libraries in other countries. This brings skepticism to the argument that access rights to digital content is strictly being regulated by authors and brings to question the involvement of publishers working with vendors and owners of LAPs when certain countries have purchase options in a LAP but others do not. In addition, it raises the question as to whether publishers may be self-selecting a country's distribution rights for particular vendors and their acquisitions platforms, without understanding the potential disadvantage for libraries that only use a single LAP. More effort should be made on both publisher and vendor sides to ensure that the same electronic titles even within a specific country are equally available for libraries to purchase.

Cases were noted where faculty authors from two Canadian institutions saw no mention in their contracts of either rights related to format restrictions, or rights around restrictions for certain countries (Anonymous, personal communication, October 24, 2019; R. Warner, personal communication, November 27, 2019). If authors are unaware these rights need to be negotiated, publishers retain all rights and therefore maintain complete control over publication format and country availability. Even if authors self-select to limit the availability of their book(s) in electronic format, or limit the sale in certain countries, at least they could do so with informed consent. An example of where this appears to be occurring more readily is with electronic textbooks, where authors are creating content they wish to make available to their students for classroom use. However, due to distribution or format rights being poorly negotiated or nonexistent in contracts, publishers are electing to offer students their facultyauthored textbooks via rental rather than ownership models, with limited accessible formats for students with diverse abilities. This provides another example for the need to educate faculty and authors on the benefits of publishing open access content.

Other cases of general unavailability have arisen when publishers choose to limit the availability of their e-books to libraries purchasing at package levels or on a single vendor's aggregator platform. Libraries or institutions with smaller collections and budgets therefore have less access to content when they are unable to purchase on a title-by-title basis. Although some libraries may have the budget for multiple EBA or subscription e-book collections, tighter budgets may require a library to take a more selective approach to collection development. Limiting access to content depending on whether purchasing as part of a package versus on a title-by-title basis may benefit a vendor or publisher, but both authors and libraries feel the consequences.

In some cases, changes of simultaneous user access licenses were noticed in LAPs, including delayed licenses for unlimited user options, as well as changes in the availability of certain licenses, such as unlimited simultaneous user licenses being replaced with more restrictive licenses after a period of time, or titles completely unavailable for purchase other than through an EBA fulfillment. Cabrera et al. (2015) explain the variation in grants of rights, with a typical contract granting rights to publishers for the author's copyright term, while some contracts limit the granting of rights to certain time periods (at which time publisher-granted rights then revert to the rights grantor). Legacy contracts can also come into play if a publisher purchases the rights to the imprint of a title originally published in print, in which case the original contract language is likely ambiguous on what constitutes a grant of digital rights (Cabrera et al., 2015).

Price fluctuations across vendors within LAPs were also noted, with prices for certain titles seeing both inflation and deflation over time. Prices also varied widely for the same title depending on the vendor a library chooses to purchase through. In some cases, e-book titles from certain vendors were DRM free and had lower prices compared to the same e-book title in the LAP from a different provider or vendor, which had strict DRM and simultaneous user limits at a higher price point. Additionally, the cost of some e-book titles from some vendors was higher for fixed use licenses (often called nonlinear or concurrent access models) than unlimited user licenses. In some cases, particularly when looking at e-textbook or e-reference titles, the cost of licensing a title was prohibitive, with some single-user titles listed at \$1,200 up to more than \$20,000 USD. Price differences were also found between e-books published in the original language and translated versions, with the translated edition appearing at a lower price point.

Additional examples exist where subsidiary rights can cause further variable access issues for libraries in the pursuit of purchasing a title in electronic format. Cabrera et al. (2015) point out that the exclusivity of content often varies across the different primary and subsidiary rights granted within the same contract, and although a contract may grant a publisher exclusive rights to publish in one format, they may have a nonexclusive right to publish in another format. Additionally, if a creator withholds subsidiary rights, this often includes reversion rights. Reversion rights allow for an author's work to be more widely read and distributed, as works that are out of print, undigitized, or otherwise unavailable have restricted public access. However, authors must actually exercise these reversion rights in order to promote their works and make them more widely available in new formats (Cabrera et al., 2015).

#### **Effects of Rights Negotiations**

Rights negotiations result in numerous barriers for libraries acquiring e-books. As noted earlier, a unique instance of the effect of these rights on libraries are EBA programs and long-term title availability. Rights negotiations can have long-term effects on a publisher's distribution options of a title acquired through an imprint. Libraries with EBA programs are now seeing titles available from those imprints in EBA packages, only to find them sometimes pulled from distribution in certain countries at the end of the EBA contract period. This causes confusion around whether content can be purchased perpetually at the end of the program, if no longer for sale in a library's country. Furthermore, it also raises questions around whose responsibility it is to track the right of sale going forward. How will the rights of each EBA title be managed?

Quite simply, strict rights limitations provide unequal access. Whether limiting by country, acquisition or aggregator platforms, formats, duration of sale, language or translation, price, or through other limitations, certain countries around the world are seeing the effect, and some countries more than others. An academic librarian in South Africa stated, "I imagined it was a third world country thing. I'm really surprised to hear that you encounter it in Canada" (C. Dean, personal communication, October 3, 2019). Information is readily available online and technology now easily enables the digitization of content, therefore how is it still reasonable to accept that access to online content can be based on a country's

status, or how is it reasonable for a single company to decide how accessible content will be?

Through conversations with authors, publishers, vendors, and librarians, we can shed light on an issue that is seemingly becoming more common for countries worldwide, irrespective of economic status or academic output. The cases presented only provide a sample of instances that demonstrate the impact of limited distribution of e-books.

#### **Possible Changes**

The exploration into the lack of library-centered literature, and the feedback from other libraries around the globe, has prompted a step back to assess how this conversation could be approached differently alongside other members of the library field, publishers, literary agents, lawyers, and even authors themselves. Consideration should be brought to the roles and responsibilities for this dialogue, as well as including wider perspectives to inform next steps in this discussion. Libraries need wider access to electronic content, authors should be open to a wider market for their content, and publishers and vendors need to move toward better addressing the needs of their worldwide customer base.

It is important to consider other roles within the library that may overlap with or encounter questions around this topic. Members of the copyright and scholarly communication fields should come together to fill knowledge gaps around some of these restrictions, and how they might envision future change in this area. One approach may be to include scholarly communication librarians in discussions with authors, to bring to their attention their primary and/or subsidiary rights, or if using publishing-focused lawyers and/or literary agents can fill that need, ensuring authors understand the full repercussions of their decisions. An education role is needed, through author guides that could bring end user perspectives, rather than the single copyright angle that is most commonly presented.

Moving beyond the library is also essential. Authors are engaging with other professions throughout the publishing process, many of which are not aware of end user needs or implications for libraries. Author education around the process is an area that needs direction and clarity, including who can support creators at each step of the publication process and who can advocate for transparency in rights

negotiations. Further efforts could support bridging publishing contracts with the needs of end users in a digital world, to hopefully create an equitable global market for libraries acquiring content for users.

#### Conclusions

Librarianship is a profession built upon the ideas of intellectual freedom and equal and unrestricted access to information. The American Library Association's own Code of Ethics (2008) outlines the desire for librarians to find a balance between the rights of copyright holders and authors, while also considering the best interests of users. When publishers create an electronic version of a print book, the content does not change. The format of an author's work does not detract from the source in its originality; it merely provides an alternative method for accessing information. Titles are written in electronic format to begin with, only later to be published in print.

Overcoming these challenges will require the education of authors, publishers, and vendors. We need to provide guidance to authors on the need to discuss and negotiate for world rights for electronic content,

and share the arguments as to why electronic format should be separated as a subsidiary right. Authors need to know more than basic copyright when negotiating with publishers. Literary agents need to consider the implications when limiting formats and creating territorial restrictions. Vendors should be aware of the controlled e-book acquisitions market in order to broaden the availability of content for their clients. Iannella (2002) offers an example of the possible layers of rights academic authors could negotiate to protect their works while also making them more accessible to users on a global scale, including establishing specific prices for specific rights as part of author/publisher agreements.

This topic and these findings will hopefully aid in the growth, evolution, and ecosystem of the rights negotiation process. Remaining at the status quo will only limit the digital landscape for e-books, with libraries continuing to face restricted digital title access, and certain countries losing out on content that is relevant and crucial for their users. Libraries and authors need to take a greater stand to take advantage of the benefits of the digital environment, stop dwelling on the habits of the print world, and move forward for the sake of the reader.

#### References

American Library Association. (2008, January). Professional ethics. Retrieved from http://www.ala.org/tools/ethics

- Cabrera N., Ostroff, J., & Schofield, B. (2015). *Understanding rights reversion: When, why, & how to regain copyright and make your book more available*. Retrieved from https://apo.org.au/sites/default/files/resource-files/2015/04/apo-nid56646-1140031.pdf
- Galligan, A. (2004). Truth is stranger than magic: The marketing of Harry Potter. *Australian Screen Education, 35,* 36–41. Retrieved from https://search.informit.com.au/
- Guthrie, R. (2011). *Publishing: Principles & practice* [e-book]. London: SAGE Publications. https://doi.org/10.4135/9781446288504
- Hadida, A. L., & Paris, T. (2014). Managerial cognition and the value chain in the digital music industry. *Technological Forecasting & Social Change, 83,* 84–97. https://doi.org/10.1016/j.techfore.2013.04.005
- lannella, R. (Ed.). (2002). Digital rights management in the higher education sector. Australia: Commonwealth of Australia. Retrieved from http://xml.coverpages.org/lannella-eip022.pdf
- Kenneally, T. (2012). "Harry Potter" e-books get worldwide library distribution. Retrieved from https://www.reuters .com/article/us-harrypotter-ebooks/harry-potter-e-books-get-worldwide-library-distribution-idUSTRE81Q 25520120227
- Magagula, L., & Oberholster, A. (2015). *Book publishing contracts, what to consider*. Retrieved from https://www.nortonrosefulbright.com/en/knowledge/publications/6763f78c/book-publishing-contracts -what-to-consider

- Schroff, S. (2019). An alternative universe? Authors as copyright owners—The case of the Japanese Manga industry. *Creative Industries Journal, 12,* 125–150. https://doi.org/10.1080/17510694.2018.1563420
- Wlömert, N., & Papies, D. (2016). On-demand streaming services and music industry revenues—Insights from Spotify's market entry. *International Journal of Research in Marketing, 33,* 314–327. https://doi.org/10.1016/j.ijresmar.2015.11.002