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Black Open Access

Shadow Libraries and Text Piracy

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Article Presentation

Article I: "Gamifying piracy: functions and users of the Z-library", Journal of Documentation, Vol. 78 No. 7, pp. 351-370. <https://doi.org/10.1108/JD-09-2021-0174>

Article II: "Decentralized digital preservation: the LOCKSS initiative and shadow libraries", Online Information Review, Vol. 49 No. 8, pp. 62-81. <https://doi.org/10.1108/OIR-02-2024-0088>

Article III: "Why does pirating papers feel so good": Analyzing Shadow Library Communities on Reddit, In Review First Monday

Article IV: "Patterns of piracy: Sci-Hub and Sweden 2011–2018." Internet Histories, 1–22. <https://doi.org/10.1080/24701475.2025.2482459>

Article V: "Exploring the Relationship between Sci-Hub and Medical Literature." Proceedings of the Association for Information Science and Technology, 60(1), 630–634. <https://doi.org/10.1002/pa2.829>

Abstract

This dissertation examines the dynamics of Black Open Access, a pirate-driven phenomenon, addressing inequities in academic publishing through shadow libraries and text piracy.

Through a methodological patchwork combining netnography, computational methods, and text analysis, this dissertation investigates how these phenomena operate at the intersection of formal and informal media economies. The results show how shadow libraries like Sci-Hub, Library Genesis, and Z-library are more than simple piracy platforms, and should be viewed as robust ecosystems with their own technical infrastructure, community norms, and justificatory frameworks. The findings demonstrate that Black Open Access solutions persist through "Pirate LOCKSS". A decentralized preservation strategy utilizing multiple domain copies and established internet platforms as intermediaries. These platforms develop complex legitimization mechanisms, from gamified user engagement systems to quasi-legal frameworks that mimic traditional academic institutions. Users justify their participation through multifaceted moral arguments about knowledge democratization and academic freedom, balanced with practical necessities driven by institutional constraints.

The dissertation shows that rather than operating in mere opposition to formal academic publishing, shadow libraries function as parallel systems that both challenge and complement traditional knowledge distribution. This creates a paradox of legitimacy wherein Black Open Access initiatives simultaneously reject copyright frameworks while reproducing many norms and practices of the formal academic system. By analyzing these dynamics, this dissertation contributes to understanding how informal media economies function in academic contexts and demonstrates how shadow libraries have become embedded in scholarly workflows, creating an alternative infrastructure for knowledge dissemination that responds to structural failures in academic publishing while raising important questions about the future of scholarly communication.

1. Introduction

“Dear Zakayo,

Apologies for the late reply!

Unfortunately, our project team is not interested in any interviews, so the answers to your questions are so cut and dry. We want to stay in the shadows :) Hope for your understanding!

1. *Approximately how many people work together in the Z-library project?* - Unfortunately, we cannot disclose this information.
2. *How do you relate to other digital libraries such as Libgen and Sci-Hub?* - Unfortunately, we cannot disclose this information.
3. *As a former librarian, I have noticed a few details on your library that are similar to things I encountered in my profession, are there “traditional” librarians amongst you?* - We're glad to hear that. But there are no librarians among us. Basically, all the team members are related to the IT field.
4. *How much time do you estimate that you spend on the Z-library project?* - Unfortunately, we cannot disclose this information.
5. *What were the motivations behind starting your own library?* - Reveal the potential of information technology in relation to paper publications and eliminate injustices in the accessibility of scientific knowledge.
6. *Do you have experience from similar projects?* - No, we don't have.
7. *In my article I am especially interested in the features that you offer and integrate into your library. Such as Booklists, telegramBot, Reviews, Requests etc. Could you explain the motivation behind their implementation?* - The main motivation for adding new features to the site is our users (they write their suggestions to us via email and on the blog posts).
8. *What features do you hope to introduce in the future?* - Unfortunately, we cannot disclose this information.
9. *How does the tiered system (basic, member, premium) and their corresponding download limits aid in the upkeep of your library?* - Our policy is based on two principles: 1. Any books/articles must be available for free download (in sufficient volume for the average user). 2. Keeping the project alive and developing the functionality requires a large financial investment, therefore, we have the donation system.

- Valeria Bookos

The fleeting nature of this exchange with Valeria marked a pivotal moment in this dissertation's development. My initial research direction was to get close to the administrators of so-called shadow libraries, large online websites, or platforms which facilitate the download of literature, scholarly and other, without restrictions – in essence piracy. The term 'shadow libraries' is particularly apt when describing the operation Valeria was part of. I attempted to reach out to a few other platforms through e-mail but was either ignored or met with a negative response. Disclosure was not of interest, except for a few short answers, and any attempts toward longer interviews were denied. The article which I mentioned in question seven to Valeria turned out to become something quite different than I had first hoped, which is not necessarily a new discovery for any person engaging with research for the first time. But the problem which I encountered seemed intrinsically linked to the subject of my study.

Shadows are inherently fleeting. Lawrence Liang, professor of law, coined the term 'shadow libraries' to describe phenomena existing “in the shadows cast by the long history of monumental libraries” he continues by explaining that shadows cast sometimes surge ahead of the shadow caster (Liang, 2012, para. 8). Shadows are, perhaps as expected, quite saturated as a metaphor (Sorensen, 2008). They have been used to describe dark imprints of permanence, a faulty assertion that sets shadows as a product rather than as something procedural (Sorensen, 2008, p.178-179). This is, however, a characteristic that shadow libraries overcomes as a semantic analogy, considering that their very existence, which parts of this dissertation will show, is characterized by impermanence. Impermanence and cyclical are perhaps the two states which best describe, not just shadow libraries, but text piracy and piracy in general. It is then reasonable to claim that shadow libraries, just like shadows, are procedural. But shadow libraries are just an under title to this dissertation, together with the less nebulous term “text piracy”. *Black Open Access: Shadow Libraries and Text Piracy* is a title I choose as it best encapsulates the different aspects of the specific brands of piracy which this dissertation deals with. Black Open Access acts as the main title, and just like ‘shadow library’, it is a collection of words which seemingly act as a designation, but on its own it is abstruse and somewhat amorphous. In other words, there is a need for a definition, in this case, I will give it by first painting an image of the problem.

In my short exchange with Valeria, she mentioned that the mission of Z-library is to “eliminate injustices in the accessibility of scientific knowledge”. This is the gist of the

problem which Black Open Access, or text piracy, aims to solve, a problem which manifests as a crisis in academic publishing. The scale of this crisis is evident in Sweden, where scientific publishing costs through the BIBSAM consortium reached 503,660.000 SEK in 2019, increasing by 32 percent in 2020 largely due to negotiations with Elsevier, one of the five largest academic publishers. By 2023, with four additional government institutions joining BIBSAM, costs rose by another 20 million SEK (Kungliga Biblioteket, 2023). This issue extends internationally, as exemplified by Canada's McGill University's refusal to accept major publisher prices due to their "commercial stranglehold" on academia (Abizadeh, 2024), and researchers abandoning editorships at prestigious journals due to excessive costs (Keilholz, 2024). The crisis also extends to the relationship between service quality and cost, which has been particularly problematic. The Library Association of Ireland publicly condemned Wiley, another one of the five largest academic publishing houses, for unilaterally withholding titles, effectively restructuring agreed-upon deals (Library Association of Ireland, 2023). Similar actions occurred across United States universities, where Wiley removed hundreds of essential titles (D'Agostino, 2022).

Black Open Access is a pirate phenomenon, and can be viewed as the pirates solution to the crisis of academic publishing. The black in this neologism represents the color of the jolly roger, but understanding Black Open Access requires examining each component of the term. Open Access was originally conceived as a solution to break free from the high expenses of subscription-based academic publishing. However, what began as a democratizing initiative has itself become entangled in market-based logic, reproducing many of the problems it sought to address. The very concept of "openness" in Open Access deserves scrutiny. Information studies scholar Jutta Haider (2018), questions the fundamental premise: if Open Access is the solution, what exactly is the problem? She argues that the focus has shifted from addressing publishing inequities to measuring researcher performance, essentially transforming openness from a means of distributing science into a "performance indicator" (Haider, 2018). A shift which reflects the deeper transformation in how academic knowledge is valued and distributed.

The "access" component has proven equally problematic. Recent research by information scientists Shu and Lariviere (2024) demonstrates that the transition to Open Access has merely reproduced existing oligopolistic structures. Eight publishers now account for 70% of

total revenue while producing only 30% of Open Access content, indicating a concentration of market power similar to the traditional publishing model. This consolidation is driven by persistent academic career pressures, as researchers continue to prioritize publication in journals that are of a certain bibliometric standard. Furthermore, as information studies scholars Lund and Zuckerfeld (2020) argue, the financial gains in Open Access publishing largely derive from the labor of academics who perform essential tasks like peer review and editorial work. Thus, rather than just making academic publishing available, Open Access has reinforced existing power structures while adding new forms of academic exploitation.

This dissertation examines how Black Open Access functions as a pirate-driven solution to academic publishing inequities. Through detailed investigations of shadow libraries and text piracy practices, it unpacks how these alternative distribution systems operate and evolve. Central to this investigation are the platforms, websites, and communities dedicated to circumventing traditional publishing through piracy. The dissertation's findings show how these initiatives emerge in the fault lines of an acknowledged broken system, demonstrating how such responses can produce sustainable models for preserving and circulating digital text media.

1.1 Aims and Research Questions

This dissertation examines the dynamics of Black Open Access within informal media economies, economies that are not regulated by market or government, focusing specifically on the role and impact of shadow libraries and other illicit text piracy initiatives. Through an array of analytical methods –including traditional and automated text analysis, and netnography. This dissertation examines the intricate relationships between formal and informal media economies in text piracy, a theoretical framework that serves as this study's primary analytical lens (elaborated in section 4). Through an exploration of the reciprocal interactions between these spheres, this dissertation studies traces of how people navigate and utilize shadow libraries to sustain their text needs. Furthermore, this dissertation examines the implications of technology and digital spaces in shaping access to information. The rise of shadow libraries, which often thrive in the interstitial spaces not governed by traditional academic frameworks, raises pertinent questions about copyright and the distribution of knowledge. This dissertation uses a patchwork of methods to analyze the behavior of shadow library users, shadow library platforms, and Black Open Access practices.

Ultimately—as the title indicates—*Black Open Access: Shadow Libraries and Text Piracy*, aims to contribute to a deeper understanding of the informal media economy, and its implications for access to text-based knowledge, academic collaboration, and the future of scholarly communication. In doing this, a secondary aim is to bridge gaps between piracy studies focused on entertainment media or books, and more specifically investigate piracy around academic texts. Consequently, the dissertation poses the following research questions:

1. How do informal and formal media economies intersect within Black Open Access, and how do these intersections shape both illicit and legitimate academic dissemination?
2. What mechanisms enable the creation and sustainability of Black Open Access communities, and how do users navigate shadow libraries to meet their textual needs?
3. How do users construct and articulate justifications for their engagement with shadow libraries and Black Open Access activities?

These research questions, in conjunction with the stated aims, provide overarching guidance throughout the dissertation's articles. While no single article addresses all questions comprehensively, each article's findings contribute to our understanding of multiple research questions, creating a cohesive analysis of the Black Open Access phenomenon.

1.2 The Emergence of Black Open Access, Text Piracy, and a few Shadow Libraries?

This section will first give a historical context, discussing early shadow libraries. Following this an overview of a selection of shadow libraries will be given in the following order: Library Genesis, Sci-Hub, Z-library, and Annas-Archive. These are chosen as they are or have been widely used, and present throughout this dissertation. Due to the nature of shadow libraries, as will be further discussed, these sites come to be defunct in the future. Black Open Access which unless in cursive will refer to the phenomena not the title of this dissertation, is widely accepted as the de-facto term for academic text piracy. Alternative nomenclatures, include Guerrilla Open Access, Pirate Open Access, and Robin Hood Open Access, each capturing different aspects of the same core activity: the dissemination of academic literature outside formal frameworks. Shadow libraries form a crucial component of Black Open

Access, serving as platforms for distributing illicit academic and other literature. This dissertation adopts Black Open Access, a term coined by Bo-Christer Björk (2017), as its primary terminology despite existing critiques and alternatives. The choice of a color-based designation deliberately connects Black Open Access to the established color schema that defines various Open Access models, a connection well-documented in the literature (Green, 2017; Björk, 2017). This chromatic classification positions Black Open Access within the broader Open Access landscape rather than relegating it to a mere fringe occurrence. The term's dual significance is particularly apt: while the 'black' references the jolly roger of digital piracy, it's important to note that not all Black Open Access initiatives operate outside legal boundaries, even though digital piracy is generally understood as illegal activity. Furthermore, it is important to use a term situated in both the world of piracy and of Open Access.

This history of shadow libraries begins with Library.nu, one of the earliest major platforms. While contemporaneous initiatives existed—including textz.com, a*.org, and monoskop—none achieved Library.nu's influence and reach (Bodó, 2018a). Operating from 2004 to 2012, Library.nu established the architectural and operational blueprint for subsequent academic shadow libraries. The platform began as “ebooksclub”, featuring the seemingly innocent tagline “... your search is over!”—a reflection of the early shadow library era's relatively relaxed attitude, one prevalent before publishers began aggressively enforcing copyright strikes. Through its evolution from ebooksclub to Gigapedia and finally to Library.nu, the platform grew to host one million books and serve 400,000 active users, which drew comparisons to the ancient library of Alexandria (Liang, 2012). The site's operations ceased in 2012 following an injunction filed by seventeen major publishers.

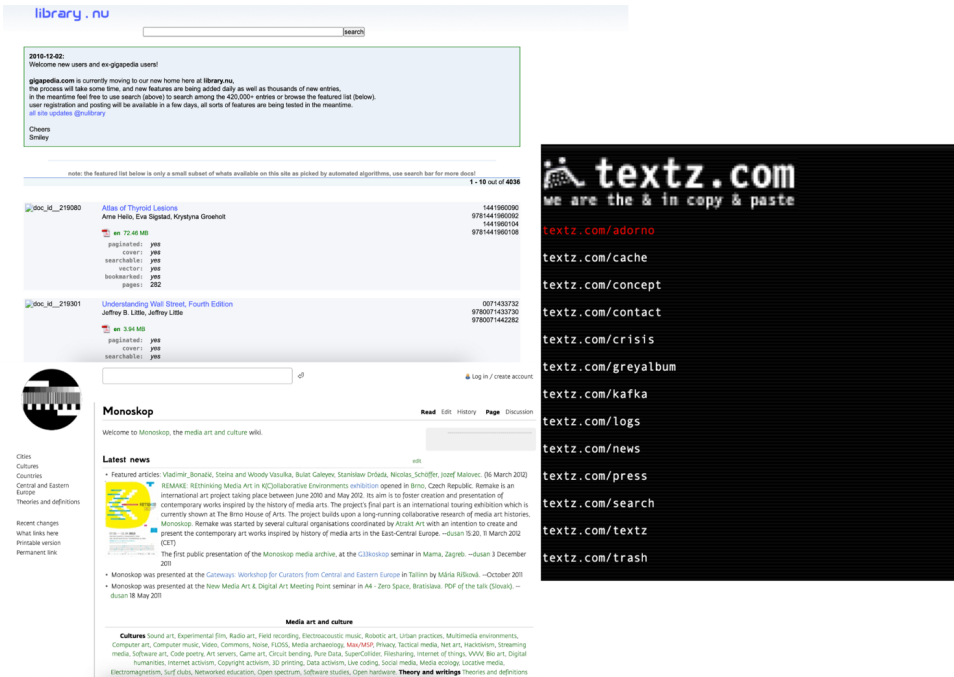


Figure 1: Front page of a few early shadow libraries. Library.nu (top left), Textz.com (right) Monoskop (bottom left). These are some of the first larger shadow libraries and initiatives for text piracy (Screenshots from 1/12-24).

In the wake of Library.nu, somewhere in the early 2010s the Russian site “Library Genesis”, or “LibGen” was born. Balázs Bodó, economist and socio-legal scholar, provides a comprehensive analysis of this transition, situating it within the broader context of Soviet and post-Soviet literary dissemination practices (Bodó, 2018a). LibGen effectively “inherited the responsibility” of serving the “larger academic community” that Library.nu had cultivated (Bodó, 2018, p.27). However, LibGen's distinctive contribution lay not in its design or functionality, but in its revolutionary infrastructure built on principles of radical openness. This approach made LibGen's entire ecosystem—including metadata, catalog, and collection—freely available for anyone to claim and repurpose (Bodó, 2018b, p.28). This innovative model served multiple purposes: it enabled the creation of mirror sites to ensure continued access, dispersed publisher attention across multiple platforms, and allowed LibGen's administrators to focus on building a robust catalog. Subsequently, other shadow libraries that followed had adopted a similar model and been able to survive legislative injunctions. This is a model which holds some precedence outside pirate circles. In

Öppenhetsindustrin, media and communications scholar Peter Jakobsson describes how corporations have used the reproducibility of digital media as a central part of their business model, the major difference to LibGen is the closure surrounding the infrastructure and technology which facilitate sharing (Jakobsson, 2012). Apart from the unique model of infrastructure and mirror distribution, LibGen grew to sizes unheard of with regards to previous shadow libraries. LibGen's beginnings as an expansion of the previous largest shadow library, Library.nu, surely gave the site a head start. At the time of writing, the total size of LibGen's collection is 272 terabytes of data. To put this in perspective, it would take me about 24 hours to download one terabyte with my meager connection speed of 100 mbp/s.

Sci-Hub is arguably the most famous shadow library. This is evident based on the amount of research as well as media attention that the site has received. Sci-Hub was created in 2011 by Alexandra Elbakyan, a Kazakh neuroscientist. In a personal blog post she claims that she created the site by happenstance. Initially the technical infrastructure behind the Sci-Hub platform was designed to get access to the blogsite LiveJournal – a site which was censored by the Kazakh government (Elbakyan, 2017). She was at the same time burdened by an inability to access academic journals and made use of the same technical knowledge to access LiveJournal to unlock paywalled articles. This idea grew into Sci-Hub over a few years, and upon its release it immediately became popular (Elbakyan, 2017). What distinguishes Sci-Hub from a site such as LibGen, is in many ways its proprietor and public face: Alexandra Elbakyan. Elbakyan has since the website's inception been a vocal advocate for her own brand of radical Open Access, for which she has gained significant support, but also recourse. The Sci-Hub project and Elbakyan are so invariably linked that it is difficult to discuss the shadow library without mentioning her involvement.

What makes Sci-Hub special is its substantial collection of academic articles. Prior shadow library sites tended to collect text in general – including fiction, comics, and magazines alongside academic literature. Sci-Hub, on the other hand, stands out as a shadow library designed for an academic community by directing full attention towards specifically academic journal articles. This tie with the academic community has, as mentioned, created an extensive fanbase for the site and its administrator, which will be further explored in this dissertation. The popularity of the site, and Elbakyan, has drawn the attention of major academic publishing houses, resulting in several lawsuits towards the site and its owner. In

total, Sci-Hub has been blocked or taken down in several nations, including Sweden. Elbakyan's ideological standpoint is another unique aspect of the Sci-Hub shadow library, where for example, attempts at opening an Open Access article through Sci-Hub will only render a conventional link to the appropriate websites – rather than unlocking a paywall. For all intents and purposes, it is quite a radical approval of a system which to a degree does not conform with the ideological statements found on the Sci-Hub webpage. With this comes an acceptance towards a system which has hounded both Sci-Hub and Elbakyan quite extensively, whilst also shedding light on how the informal media economy is closely linked to its formal counterpart. Elbakyan has in the past had close connections to LibGen's servers but is not officially affiliated with the sites team (Elbakyan, 2017).

This is not the case of the Z-library. The shadow library was for a period a very popular shadow library site. This due mainly to its design, functions, and user interface (as I have argued in the first article of this dissertation). What distinguishes Z-library from Sci-Hub and LibGen, was the distinct focus on user friendliness. Despite having identical collections to other shadow libraries, the design choices made for a more familiar user experiences – in comparison to the more drab and pragmatic designs of other major sites. Another aspect which made Z-library different in comparison to LibGen or Sci-Hub was the more significant reliance of funds needed to sustain the considerable userbase. Z-library had a membership tier system, which depending on work put into the platform or money donated, equates variance in how much a single user could download. By limiting the downloads per users, Z-library effectively curbed the amount of traffic which allowed it to sustain its extensive user-base without crashing down. Its downfall, however, came at the hands of its popularity. At its peak, Z-library was shared by prominent literary TikTok channels, so-called "BookTok", which drew attention from large publishing houses and American federal police. In November of 2022, two administrators of the site were arrested, and Z-library was removed from Clearnet (i.e non-darkweb) sections of the internet. To add to the fleeting nature of shadow libraries, their administrators seemingly share the same trait, as the extradition orders to the United States was being finalized, the two had escaped their house arrest in Argentina (Maxwell, 2024). The site was temporarily forced to operate solely on the dark web. As of late 2023, Z-library returned to Clearnet addresses, using personalized password-protected domains individualized for each user. In effect, the spread on BookTok, or any other media for that matter set the scene for shadow libraries to be noticed by authorities and brought to their end.

Even research into the topic provides avenues for legislative incursion, which shadow library administrators and users alike are aware of. At the same time, this is exactly the kind of attention that these sites need to further their work. In essence, threats against Black Open Access initiatives are in and of themselves also boons for their continuation. It is clear that finding the balance between protecting the sites whilst simultaneously marketing them is a strength which is rarely accentuated in discussion on Black Open Access sites, but an effective way to illustrate the resilience and persistence of shadow libraries and Black Open Access overall.

Annas-Archive, originally known as Pirate Library Mirror, or PLIMI, set to create a waypoint for which users could access large illicit book collections. The original intention of the Pirate Library Mirror was to “preserve and liberate human knowledge” which differs greatly from the other shadow libraries described, which intend to disseminate and spread (Anna, 2024). Preserving and liberating has certain limitations for Annas-Archive, they have set their intention on gathering literature in a way, with a preference towards the academic and rare, that is specifically illicit. This means that literature outside the bounds of copyright holds lesser interest. PLIMI came to be Annas-Archive during the same period as Z-library was shutdown. Despite the name change, Annas-Archive’s model remains the same, with a goal of collecting all the worlds knowledge rather than spreading it. If looking only at their stated goals, the sharing comes as a byproduct of their preserving efforts. However, considering the design and focus on downloads it becomes evident that spreading literature is of equal import.

When discussing Annas-Archive, it is important to note the scale to which they have brought their collection. With regards to the totality of literature in the world, the site claims to have covered five percent of everything published. This may seem like a small amount, but equates to almost a petabyte (1000tb) of total storage. At the moment of writing the shadow library has access to 37.6 million books and 105.7 million academic papers. Annas-Archive gathers books from their own user-base, and other undisclosed methods, and has a collection that mirrors both that of Sci-Hub, Z-library and LibGen. The shadow library also actively gathers large collections from smaller and international shadow libraries. These collections are stored as torrents, which means that they exist in fragments amongst users and servers spread across the web and the world. Despite being accessible to download from single repository sites, the actual place in which they exist is effectively distributed and shared. As part of Annas-

Archive’s mission, they share their collections freely with all who wish to download them in bulk and encourage their users to seed (i.e help sharing) their torrents over the web – the distributive, decentralized network that they have created persists.

Shadow library websites are not the only part of Black Open Access, there are many other avenues to disseminate academic text illicitly. #Icanhazpdf is an initiative on Twitter / X which works as an informal type of loan between users. A person in search of a specific PDF tweets a title with the hashtag and another person satisfies the requests. Similar to this is the r/scholar subreddit on Reddit. Which much like the hashtag on twitter works on a requesting basis, where users’ request aid in finding literature from their peers on Reddit. There are also several Facebook groups that operate using the #icanhazpdf model, in the figure below, an example of how to inquire to one of these groups is shown:

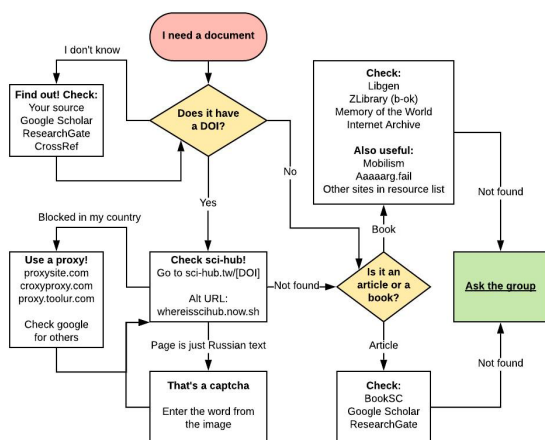


Figure 2: Flowchart taken from a Facebook group dedicated to the informal sharing of academic text. The flowchart describes how new users should use the groups collective resources.

The practices are not reserved to social media, but as some of the case studies presented in the dissertation’s articles show, they are spread across the internet’s larger hubs. From Google, to Wikipedia, there are infrastructural components in play which help facilitate the users and shadow libraries alike in their continued existence. A minor example is SLUM, or the Shadow Library Uptime Monitor, which aids users in guiding them to correct shadow library domains

whilst simultaneously shows whether the sites are live or not.

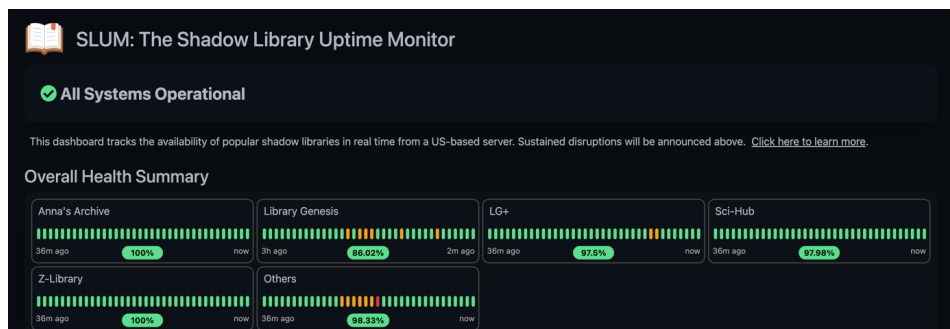


Figure 3: Screenshot from the <https://open-slum.org/> website, 13/9-2024. A site dedicated to show which Shadow library sites are online and how well they are operating.

While SLUM is not the only initiative of its kind, it exemplifies the sophisticated organizational structure of the Black Open Access community. One which stays true to the mission of freely sharing access to knowledge.

2. Previous Research: Piracy and Piracies

Fundamentally, this dissertation is one about piracy. Focal points such as academic publishing, copyright, or preservation are touched upon to add to the understanding of the informal media economy. The contents of this body of research are extensive and cover the entire breadth of copyright and piracy history. This section on previous research will show some of the works which take this longer perspective on piracy, and in doing so lay the groundwork to bridge the gap between entertainment piracy and academic piracy. This section will show how pirate studies does not necessarily belong to any specific field. Instead, I will give examples from fields relevant to the work in this dissertation, and by doing so situating it within a section of pirate studies. First off, an overview of how piracy has been understood from a larger historical perspective After this section, piracy in the context of media studies will be brought into the forefront, followed by a section on how piracy has been discussed in library and information studies. A concluding section will discuss perspectives from pirate studies to show how they together contribute to the proverbial shoulders which this dissertation aims to stand upon.

Textual piracy is far from a recent phenomenon, book historian Robert Darnton has written extensively on early book piracy. In the book *Pirating and Publishing*, he details the complex and often contradictory world of publishing in France during the enlightenment (Darnton, 2021). Despite the absence of copyright as we know it, the control of publishing and book trade lay with the Parisian book guild and printers. Their status gave them a near-monopoly, due to what was called "privileges", a sort of proto-copyright which granted them the sole provision over printing, as well as an enforcing power of censorship (Darnton, 2021). The guild was a strictly hierarchical, aristocratic and hereditary enterprise. In opposition, or rather competition, was the Fertile Crescent. A group of publishers located around and outside France borders, they made their money producing cheap editions of books published by the Parisian Guild, essentially pirate copies. Their motives were monetary, but they drove the proliferation and distribution of controversial works by authors such as Rousseau and Voltaire due to their popularity. The Parisian Guild of publishers did not print the radical literature which led to an upswing for publishers across France and Switzerland that did not conform to the restrictions imposed by Guild or Crown.

Piracy in this context differs quite a bit with the piracy that this dissertation deals with, but shares some similarities. Piracy, in the historical French context was initially driven by monetary goals, but later turned to radical ideological motors – much like the shadow libraries of today. Older forms of book piracy hence resemble shadow libraries, and naturally the latter also have a history. One of the first historic studies of shadow libraries was written by Balász Bodó in 2016: "Pirates in the library –an inquiry into the guerilla Open Access movement". This article details the growth of shadow libraries, from Gigapedia to LibGen and Sci-Hub. The article frames the expansion of the shadow library community in contrast to the slow bureaucratic development of Open Access, whilst pointing out the inequity built into the subscription-based options offered by the formal media economy of scholarly publishers. Bodó's genealogy and analysis of shadow libraries are further built upon in the two chapters he authored for the anthology *Shadow Libraries Access to Knowledge in Global Higher Education*, edited by Joe Karaganis (2018). In the chapters, Bodó traces the origins of the shadow library Libgen, from Soviet copyright legislation to black-market samizdats, RUnet internet culture, and finally, the initial shadow libraries. The second chapter is one of the first comprehensive mappings of Libgen's collection, revealing subject matters, top publishers, countries of origin for downloads, and language distribution amongst many variables (Bodó,

2018). Tracing media piracy to samizdats and Soviet copyright laws is not, however, unique for Bodó, looking at books and other media forms, other researchers have made the same connection between piracy and the tradition of intellectual property in the former Soviet Union (Johnston, 1999; Haigh, 2007; Sezneva, 2013).

Olga Sezneva attributes the development of black-market music and film shops in Russia to the same samizdat tradition. Sezneva presents an extensive understanding of the culture and tradition surrounding “illegal copying” and intellectual property in Russia and the former Soviet Union (Sezneva, 2013). She argues that it is the result of primarily two dominant features of Soviet politics. First the idea of “cultural goods as carriers of ideological messages”, a feature that permeated Soviet cultural production. This essentially meant that cultural goods should be easily accessible and disseminated at a free or low charge to reach the people as extensively as possible. This was constructed around low levels of legal protection for intellectual property (Sezneva, 2013). Haigh adds to this perspective and argues that the idea of “freedom of translation” was the prevailing attitude towards copyright within the Soviet states for a significant period of its existence (Haigh, 2007). This freedom allowed official Soviet publishers to translate and circulate a large amount of non-Soviet literature without regarding international copyright laws. (Haigh, 2007). Sezneva’s second argument is based on the idea of black markets. Since cultural goods within the Soviet Union was so strictly controlled and centralized, black markets were an essential part of Soviet culture, as a response to the restriction of western, and primarily American, cultural goods. Black markets created large de-centralized networks for the distribution of dissenting/western literature and cultural products, ranging from blue jeans to American, anarchist, and liberal literature (Sezneva, 2013). The tradition of black markets continued to live on through the liberalization of Russia during the 1990s and onwards (Sezneva, 2013). The very core of the shadow library ideology, based on the previous research, stems from remnants of Soviet culture. Considering that some of the more prominent shadow libraries (Libray Genesis, Z-library, Sci-Hub) have administrators that stem from the region, further shows the influence this has had on shadow library culture. What seemingly defines the inception of shadow libraries is the remnants of the rampant informal media culture that was pervasive in the Soviet Union compounded with the lax formal regulations regarding copyright.

The evolution of piracy practices in other media industries offers valuable insights for understanding text piracy's development and implications. The film industry, in particular, demonstrates how copyright challenges and informal distribution networks emerge alongside new technologies. This parallel becomes evident as early as 1902, when George Méliès released one of the very first science fiction films: *Le Voyage dans la Lune*. The release was fraught with illicit distribution. One of the culprits was the Edison Manufacturing Company, which was able to purchase copies of the film meant for Algerian audiences and distributed them in the USA (Solomon, 2011). The very beginning of film history is, as argued, tightly connected to pirate copying. This is evident in the period between the invention of the motion picture and its subsequent inclusion into the copyright act as a distinct media format (Decherney, 2007). This was a period that film historian Terry Ramsaye described as a “lawless frontier” (Ramsaye, 1964). In the spread of films beyond the movie theater, new avenues for piracy soon followed. With the VHS, the possibility to record, duplicate, and most importantly disseminate audiovisual content beyond formal distribution channels became a possibility for the average layman. This resulted in significant networks of distribution that stretched throughout Eastern Europe, Asian, and Africa, where pirate copies of VHS-tapes, in many cases, were the only viable alternatives for film consumption. In Nigeria, the initial informal distribution networks became the very basis for their already burgeoning movie industry, lending weight to the productive aspect of piracy which is often overlooked (Lobato, 2011). The DVD’s technical affordances further developed the already established channels for pirate distribution. It is important to note, at this section of the screen pirate history, that all new forms of media technology have had their counterpart in piracy – a fact which was exacerbated with the introduction of digital technology. The new digital format multiplied the possibilities for spreading content and introduced various new types of piracy. Its introduction has been described as “Hollywood’s Digital Frankenstein” due to these new factors (Lobato, 2011). One main factor behind the unflattering moniker are so-called preview discs, early renditions of movies given to everyone from producer to production staff. These were often leaked and spread along those same informal channels. From the beginning, streaming was seen as the first real cure against digital piracy in film, an assumption which computer scientist Janne Riekkinen has postulated to be untrue (Riekkinen, 2018). This inevitably moves the study of piracy into the realm of industry and economic theory. Akamai, a leading internet security firm, have also shown how the ever-growing landscape of streaming services has reverted many users to piracy, citing that access and

availability being a chief concern for those which seek out pirated movies, TV-shows and other media content (McKeay, 2022). Economists have found a correlation between availability of movies on Netflix and an increase in piracy intent, meaning that which cannot be found on legal streaming channels, or is outside the purview of the end consumer tends to be pirated (Frick, et al., 2023). Piracy returns to its original onset as in the case of French book pirates and their spread of literature which simply was popular. Piracy in this circumstance becomes productive in a different sense, in comparison to the Nigerian movie business, a necessity to even view the media product at all.

Several academic disciplines have contributed to and shown an interest in the scholarship on media piracy. Media and communications scholars have examined distribution and its consequences, a perspective that creates nuances around what media production is, how media cultures develop, and what material consequences this has for the production of media (Snickars, 2024; Kunze, 2023; Ibojiola et al., 2018; Lobato, 2012). For similar reasons, there are economists interested in the economic ties found in pirate “industries” which create new avenues for the circulation of capital as well as new forms of economies that differ from the traditional normative western models (Frick et al., 2023). There are sociologists of law and lawyers, who take aim at the legal repercussions of piracy, weighing them against questions of morals and ethics (Larsson et al., 2012). Book historians show interest in all these factors but focus more closely on their consequences for the development of older text and documents (Darnton, 2021). By no means does this represent all subjects interested in piracy, but it shows the breadth of research fields that this dissertation adds to. The connection to the text piracy community, and the intention of this dissertation becomes more salient in this context.

Piracy, regardless of the media format which is pirated, tends to be motivated not by greed or malicious intent, but by exclusion from the formal distribution channels, often motivated by the economic decision taken beyond consumer-level. This underlying cause, however, represents just one factor among many, as piracy manifests through numerous impulses that stem from different personal, cultural, and socioeconomic circumstances. This can be closely linked to what Ramon Lobato describes as the paradox of piracy, in which piracy tends to be viewed as *one* thing rather than a multitude of practices which invariably differ depending on context. He discusses these practices and their social, legal and cultural distinctions as

piracies heterogenous practices with significant variances which ultimately only happen to have copyright infringement as a commonality (Lobato, 2014). The long historical perspective, and the many faces of pirate studies, is often ultimately be understood as a counterpart to copyright, but should, as argued, be viewed as more than just an oppositional force.

2.1 Piracy as Culture: Perspectives from Media and Communication Studies

This section examines how piracy has been conceptualized primarily within media and communication studies, while also drawing on interdisciplinary insights from adjacent fields. Scholars within media studies have developed frameworks for understanding piracy not merely as illicit distribution but as cultural practice with its own communities, norms, and justificatory discourses. While the core analysis draws from media scholars it also incorporates valuable contributions from scholars with backgrounds in information science, socio-legal studies and intellectual property research, demonstrating how the study of piracy necessarily crosses disciplinary boundaries.

When discussing piracy, there is often a certain irony where pirates and their culture tend to be overlooked, with more focus being put on the actual media being pirated. This is one of the key features which the study of piracy in media studies ameliorates. An especially overlooked segment are the pirates which work at the top level of illicit file-sharing, a community dubbed "The Scene" (Eve, 2021). This part of the pirate community often operates on different standards than, for example those that upload files on public torrent sites such as the Pirate Bay. The Scene is not so much a tightly organized group operating in the illicit arena without rules, but rather it is a loosely interwoven web of individuals with a strict code and procedure, premiering quality before anything else (Eve, 2021). This also ties into what Bodó (2014) discusses as an informality which is regulated, adhering to certain standards upheld with for example a pirate community. In fact, there is a rivalry intrinsic to the scene, where those who are first with an upload often are lauded (Rehn, 2004). Despite the competitive aspects, The Scene aims to ameliorate what has been confirmed as the chief motivator behind illicit file-sharing: access, claiming that the work they performed is galvanized by the purported injustices in media distribution (Rehn, 2004). In the community an often cited reason for the existence of shadow libraries is: to reclaim that which rightfully belongs to the public (Barok et al., 2015).

Pirates and their justification have been previously studied. Most notably, media and communication scholar Jonas Andersson Schwarz has discussed justifications in terms of media piracy in several works, exploring the justificatory discursive strategies of illicit file-sharers (Andersson Schwarz, 2010; Andersson Schwarz, 2014). He has established online file-sharing as a tactical reappropriation, which is both hybrid and paradoxical. The tactical aspect refers to how file-sharing techniques and technology require an industry standard to appropriate and pirate before becoming popular (Andersson Schwarz, 2014, p. 197). This can be seen in the early film piracy techniques, or in the reliance of a DOI infrastructure to make academic articles searchable. Hybridity is tied to tactics, as file-sharing almost always draws on both the licit and illicit, by reappropriating techniques that exist legally in an illegal fashion. This is a point which was also established in the project Cybernormer a socio-legal working group which, together with The Pirate Bay, conducted an extensive survey which investigated legal norms amongst file-sharers (Larsson et al., 2012). They established that file-sharers use anonymity in varying degrees dependent of legal and social pressures. Tactical reappropriation and hybridity, manifest themselves as paradoxical, meaning that the foundation on which online file-sharing stands is in its nature perplexing. Illicit file-sharing denies the cost of reproduction of information (which is meager), but simultaneously tends to disregard the initial production costs, it is in its essence almost techno-utopian whilst also harkening back to an unregulated prehistory of cultural production (Andersson Schwarz, 2014, p. 205). Pirates then tend to create grander narratives in which their paradoxical practices in essence are for the good of society, partially to come to terms with the perplexing character of their actions. Andersson Schwarz argues that file-sharers tend to argue for the democratization of information, and in extension democracy overall, in a discourse which is explicitly opposed to copyright (Andersson Schwarz, 2014). The justificatory narratives that file-sharers construct find parallel in what anthropologist Ashley (2015) terms "honorable piracy" in the Chilean context, where unauthorized media distribution became linked to democratization efforts. This mirrors the tendency found among file-sharers, who tend to argue for democratization of information. However, as information scholar Hemmungs-Wirtén (2006) argues, such rhetoric around "freedom" and "free culture" often oversimplifies complex issues, demonstrating the paradoxical nature identified in piracy practices.

Copyright is also important when surveying media and communication studies research on piracy. An important aspect of copyright – as can be seen in the areas from where shadow libraries originate, is how it is viewed differently in different regional juridical contexts. And

more importantly in places such as developing nations, which in turn is a perspective marred with colonial legacies (Hemmungs-Wirtén, 2010). This may have had an effect on how the prospect and understanding of shadow libraries differ. From this perspective the idea of piracy, or "sharing" is much more tightly connected to a material reality rather than a question of ethical judgment. The colonial legacies that Hemmungs-Wirtén (2010) identified in copyright discourse are further complicated by media scholar Fredriksson's (2014) examination of how copyright itself became associated with Western notions of civilization. This dynamic manifests in how different regions approach shadow libraries and sharing practices, with developing nations often viewing these practices through a lens of necessity rather than purely ethical considerations. This geographical divide in copyright perception is exemplified in media and literary scholar Sarkar's (2016) critique of how Western discourse creates problematic distinctions between "good" piracy (creative remixing in the West) and "bad" piracy (purely parasitic activities in Asia and Eastern Europe), further reinforcing the colonial undertones in copyright discourse, which in turn can be discussed in connection to the paradoxical nature of piracy, and *piracies*. This is evident in articles written in areas where material conditions motivate usage, based on necessity, rather than simplicity or "principles of least effort" (Bendezu-Quispe et al., 2016; Couto, Ferreira, 2019; Buehling et al., 2022; Corrales-Reyes, 2017). Medical researchers Bendezu-Quispe et al. (2016) compound the material reality of "non-access" to the ethical dilemma of forced daily usage of illegal alternatives. The material conditions that Bendezu-Quispe and colleagues (2016) identified as motivating usage in developing regions find echo in Beirne's (2015) concept of "geo-access piracy." This framework helps explain how geographic restrictions and market failures create conditions where piracy becomes less about ethical judgment and more about necessity, supporting the earlier observations about regional differences in piracy perception. This material reality of "non-access" compounds with what information and communication scholars Couto and Ferreira (2019) identify as parallel Open Access, which challenge the traditional narratives about the relationship between piracy and legitimate distribution channels. As seen in the research on book piracy (and piracy overall) new media or technological development rarely quench the thirst for piracy. Couto and Ferreira's 2019 article is more in tune with the line of argumentation that Elbakyan herself presents on her blog, equaling the work of Sci-Hub with Open Access, thus contending the assertions of academics who claim that Sci-Hub and other shadow libraries are antithetical to Open Access development (Jandric, Hayes, 2019; Green, 2017). Couto and Ferreira (2019) voice some of

the aforementioned criticism of the pirate-inspired terminology of "Black Open Access", based on this fact. Instead they discuss the term parallel Open Access, rejecting the notion of "black" as a distinctly negative color, as in "black" (illegal) market. Their argument is also reflected in Haigh's article, despite focusing primarily on music, Haigh lifts several interesting points on the correlation between samizdat, former Soviet states, and piracy relevant for the study on shadow libraries. Haigh points out that the study of piracy (at the time) oftentimes regarded the technical, legal, or economic rather than the cultural side of pirating.

Moving the pirate practices into the realm of Open Access as an adjacent parallel, rather than a negatory non-Open Access practice, complicates and nuances the dialogue between the terms, legal and illegal versus ethical and unethical. This notion is further exacerbated when examining how piracy practices become integrated into legitimate market structures. Morris (2015) demonstrates this through his analysis of Napster's "commodity communities," where anti-commercial behavior generated valuable market insights, exemplifying hybridity in unexpected ways. The paradoxical nature of piracy becomes even more apparent when considering how platforms that supposedly threatened the music industry while simultaneously providing it with crucial market research data through new media metric companies like BigChampagne (Morris, 2015). The tactical reappropriation that Andersson Schwarz identified finds historical precedent in unexpected places. Media scholar Skågeby's (2015) analysis of Sweden's *Datorernas värld*, a public service radio program from the mid 1980s that transmitted code for computer software to be recorded, demonstrates how sharing cultures emerged through creative combinations of existing technologies, prefiguring the hybrid nature of modern file-sharing practices. This media historical example supports the argument on the paradoxical foundation of file-sharing, as it simultaneously embraced new technological possibilities while operating within existing media frameworks, which also mimics the relation between formal media economies and informal media economy practices. Adrian Johns suggests that piracy is a matter of practice as well as production (2009). The, sometimes, overwhelming support for piracy may be telling of a pattern of practice that moves beyond the apex of aesthetics and is rarely a consequence of ideological positioning where piracy often is favored. Rather, the question of piracy extends beyond the limits of practice and production and should also be considered as a symptom of consumption. As Joe Karaganis has argued, there is a need to also view the problem of piracy from the view of individuals, and primarily as the only option of access to increasingly inaccessible forms of media (2011). These analyses demonstrate how piracy practices continue to exist in what has

been called a "hinterland between official, public life and unofficial, private life," while simultaneously revealing how this space becomes increasingly complex as piracy practices interact with legitimate market structures, regional differences, and material necessities (Andersson Schwarz, 2014, p.198). The paradoxical nature of these practices becomes even more apparent when examining how they both challenge and reinforce existing power structures.

The study of piracy in media studies, can be summed up as a researching endeavor which aims to understand the practice, economics and cultures of illicit media distribution. The cases mentioned above deal with these three facets in some way, but are by no means exhaustive, Instead, they serve as representative of how the field has dealt with conceptualizing piracies, allowing for a perspective that understands piracy beyond simple binary oppositions of legal versus illegal or ethical versus unethical. This idea of piracy as a multitudinous, creative, and destructive force lends itself to the study of piracy, but more importantly for this dissertation, to the study of shadow libraries, Black Open Access and text piracy.

2.2 Piracy as (infra)Structure: Perspectives from Library and Information Studies

This section examines how shadow libraries have been conceptualized and studied within Library and Information Studies (LIS) and related disciplines. While media studies approaches tend to focus on cultural and social dimensions of piracy, LIS scholarship emphasizes infrastructural aspects – examining how shadow libraries operate within, alongside, and sometimes parasitically upon existing knowledge systems. The LIS approach to shadow libraries is characterized by methodological diversity, ranging from large-scale data analysis of download patterns to more focused studies on how these platforms affect traditional library services and scholarly communication ecosystems. This research draws not only from core LIS scholars but also incorporates insights from computer scientists, economists, and data scientists who analyze both the technical mechanisms and institutional impacts of text piracy

When discussing piracies in Library and Information studies (LIS), there is reason to first return to the coining of the specific type of pirate sites which facilitate text piracy: "shadow libraries". As mentioned in the introduction, shadow library as a defining term for the concept of illegal digital repositories of books, was first used by legal scholar (and copyright critic)

Lawrence Liang. His defining article was written as a part eulogy for his own destroyed collection of books and the closure of the shadow library: library.nu. In his eulogy Liang discusses shadow libraries as heterotopias, specifically with regards to the platforms possibility of bringing together heterogeneous collections of unusual things, in usual places. This also serves as an apt description of how the study of shadow libraries has materialized in the LIS field. It stretches between the larger macroscopic perspective which gives an overview of how text piracies affect libraries and publishing as a whole, to the more granular studies on how specific shadow libraries are used within a certain field.

The beginning of the study of shadow libraries was closely linked to simple understanding, what were these sites? And how were they used? These studies more often than not aimed to simply understand the phenomena of text piracy. This was an important beginning as the use of shadow libraries, before their exposure in larger scientific magazines and journals, was reserved for a niche community. A Google trend study performed by information scientists, medical scholars, and data scientists Himmelstein and colleagues (2018), show significant spikes in Sci-Hub trending after publications describing its functions. Their contribution also lends to the multidisciplinary character the study of shadow libraries is, with representatives from fields such as Library Studies, Life Science, and Data Science. The type of study which came to demarcate the beginning of serious shadow library inquiry also came to be the de-facto modus for studying shadow libraries. Journalist John Bohannon was instrumental in pioneering the method of mapping shadow library use. His article in *Science*, "Who Downloads Pirated Papers? Everyone" illustrated how the use of shadow libraries was common across several academic demographic contexts (Bohannon, 2016). What made this study unique, in comparison to previous efforts, was the access he had gained to the download log of Sci-Hub, through close collaboration with Alexandra Elbakyan. The dataset which was released together with the article has been re-used many times in a variety of studies showing regional, national and subject specific tendencies in downloads from the site—and is also present in this dissertation.

Notable studies which have utilized this dataset are, previously mentioned LIS scholars Machin-Mastromatteo and colleagues (2016), information scholar and bibliometrician Nazarovets (2018), computer scientist Androcec (2017), and economists Timus and Babutsidze (2016). These papers showed the effect of Sci-Hub across disciplines, regions, and countries, inadvertently promoting not just the continued study, but the use of the site, as

discussed by Himmelstein et al. Other's have also made the same assertion, pointing out that the study of Sci-Hub and similar shadow library sites directly influenced their use (Nicholas et al., 2018). As mentioned, these studies inspired others to follow suite. Bioinformatician Bastian Greshake used the dataset released by Bohannon and Elbakyan together with a newer more extensive dataset, released only by Elbakyan, to add to and develop the original assertions made in Bohannon's first article. Greshake's paper further affirmed that Sci-Hub was used extensively across several demographic subsets, whilst also pointing towards the oligopoly of publishers and their presence in the download statistics.

Moreover, Bodó and colleagues (2020) in an article entitled "Can scholarly pirate libraries bridge the knowledge access gap" have used descriptive statistics to discuss how the use of LibGen varied across different economic contexts, both globally and within the European Union. Their study showed how the production of knowledge was intrinsically linked to the need for more knowledge, which inevitably lead to increased use of pirate sources, further asserting that text piracy was not necessarily a result of lack of access to resources, but dependent on circumstances of need (Bodó et al., 2020). Research by information scientists Amin and colleagues (2021) demonstrated that while traditional publishers like Elsevier maintained higher traffic rankings, Sci-Hub showed stronger user engagement metrics, particularly in developing nations. This finding aligns with Boudry and colleagues (2019) investigation showing significant inequality in access to scientific articles, with some institutions having access to less than fifty percent of paywalled content.

Another aspect of information studies related research around text piracy highlights that the impact of shadow libraries extends beyond access. Scholars working within behavioral data science, have for example in the article, "The Sci-Hub effect on papers' citations", argued that articles downloaded through Sci-Hub received 1.72 times more citations—though causation remains unclear (Correa et. al., 2022). This global influence is further evidenced in Duić and colleague's (2017) examination of Croatian faculty, where 46.3% reported using shadow libraries due to inadequate institutional access. The extent of shadow libraries' reach is demonstrated in Houle's (2017) analysis showing 70% retrieval rates across disciplines, with major publishers having nearly complete coverage. As seen in the study of piracy in media studies, there's also inquiries on the effect shadow libraries have on their formal counterpart. LIS scholar Hoy (2017) argues that libraries should focus on education about legal

alternatives rather than prevention. This tension between access and ethics is central to medical doctor Aniruddha Malpani's (2020) framing of the "Robin Hood dilemma," questioning whether unethical means can serve ethical ends in academic publishing. The impact on regional scholarship is notable, with Singh and colleagues (2021) finding that 90.25% of Indian research papers from 2016 available through Sci-Hub, compared to only 24% through legal Open Access channels. Green's (2017) assessment that traditional Open Access models have failed while black Open Access has "succeeded" points to fundamental issues in the current scholarly communication system that shadow libraries both expose and exploit.

Diverging from a more general use-perspective on shadow libraries are studies focusing on their abuse of and effect on integral library functions. Commonly, this refers to the use of stolen credentials to download articles en masse (Himmelstein, 2018; Cabanac, 2015; Hoy, 2017). This example was established by computer scientist and information scholar Guillaume Cabanac (2015) who introduced the term "biblioleaks", pointing to the leakage in integrated library systems as an integral point of exploitation for shadow libraries. Leakage as a conceptual understanding of Black Open Access was given empirical support in library scholars Carolyn Caffrey Gardner and Gabriel J. Gardner (2017). They detail how shadow libraries exploit university library inter-library loan systems, and institutional administrative library accounts to illicitly disseminate academic texts via Twitter / X. Librarians Gardner and colleagues (2017) further developed this notion and described how shadow library usage possibly could hurt interlibrary loaning (ILL). They did so by comparing the decline of ILL and the use of Sci-Hub in a selection of cities, a central problem with this study was that it cannot account for VPN's and other alternatives which in conclusion makes it hard to find a definitive correlation of users utilizing Sci-Hub in place of ILL (Gardner et al., 2017). Developing on the repercussions of shadow libraries on ILL systems, librarians Kaitlin Kehnemuyi and Sylvie Larsen describe how hackers compromise accounts and use them to order ILL to expand shadow library collections (Kehnemuyi, Larsen, 2020). Using library systems in this way is a sophisticated method to avoid detection, as the requests made to the system are not as easily traceable as a mass download from a single user, the sophistication is elevated when the requests are made from accounts with stolen institutional credentials (such as a mail address affiliated with a university library), thus increasing the trustworthiness of the request (Kehnemuyi, Larsen, 2020). Hatching onto existing systems both serves a modus, and

continuation of shadow library. To further push this idea, one can discuss the pirate as parasite, in the context of Michel Serres, as exemplified in media scholar Thylstrup (2018). Ironically, Alexandra Elbakyan was used as an inspiration when a group of Russian scientist found and named a new type of parasitoid wasp: *Idiogramma elbakyanae*, a move which at first angered the Sci-Hub administrator prompting her to shutdown the site in Russia for a period of time (Travis, 2017). Serres parasite, is often equally misunderstood, but in the context of shadow libraries it assumes that the workings of the pirates/thieves/shadow librarians, which in contrast to a traditional librarian, are both the custodians and the patrons. Albeit some might hold more dominant or controlling positions within shadow library platforms, they are all, in some way or another, both adding to and downloading from the shadow library collections, much like the members of "The Scene" as discussed by Martin Paul Eve. Sci-Hub for example has used Libgen to both crowdsource and archive their collection of articles (Cabanac, 2015), thus, both building and maintaining a larger collection.

Piracies in Library and Information studies and adjacent fields, takes the occurrence of text piracy and applies it more directly to consequences it has to specific institutions such as copyright, libraries, and publishers. They serve as more instrumental starting points when examining the phenomena of text piracy, which in this dissertation inspires a pragmatic viewpoint on the effects of Black Open Access.

2.3 Research Fields – A Multitude of Piracies

Despite the seemingly vast body of works cited in the previous sections on media studies and LIS, there needs to be an understanding that not one specific subject has laid claim to researching piracy. To show this, I have selected the following representative search words "Library Genesis" OR "Libgen", "Sci-hub", "Annas-archive", "Black Open Access", "Text Piracy", "Book Piracy", "piracy" AND "academic publishing", "illegal file sharing" AND "academic", "biblioleaks", "guerrilla Open Access", "interlibrary loan" AND "piracy", "parallel Open Access", samizdat" AND "digital piracy". Together these keywords cover most of the subjects discussed in the previous research. To really come to terms with the fields which this dissertations braces itself against, I plugged them into Web of Science (WoS), and in return I received 71 results from the Web of Science Core Collection, which covers more than 92 million papers, book chapters and reports.



Figure 4: A breakdown of the subjects which have contributed to the study of shadow libraries from the Web of Science Core Collection.

I did the same search in the Scopus database, just to make sure that I had covered as many bases as possible. This search rendered 86 results with the following distribution of subjects:

Documents by subject area

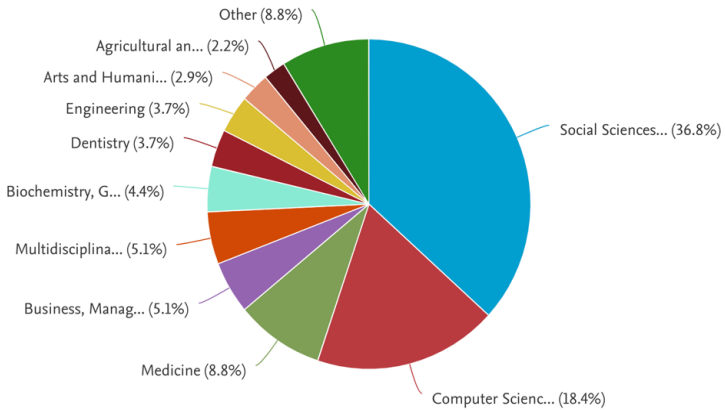


Figure 5: A breakdown of the subjects which have contributed to the study of shadow libraries from Scopus

From WoS it is clear that the subject of shadow libraries and text piracy is dominated by scholarship in LIS. In Scopus, it is attributed to social sciences, which when investigated a bit closer, mostly is made up of LIS studies. That the Library field has a vested interest in the study of shadow libraries is obvious. First, Black Open Access, an overarching umbrella term, is derived directly from the Open Access system which in turn is related to LIS areas of focus. Furthermore, shadow libraries act as competition not just to the formal publishing industry, but to the formal media economy overall - which inevitably includes libraries. But LIS is not the only social or “multidisciplinary” science interested in shadow libraries. Despite not being explicit in either Scopus or WoS, the fields which have dedicated the most to the study of text piracy, shadow libraries and Black Open Access are Media Studies, Sociology, Computer Science and History (especially book history and media history). Each of these subjects bring unique perspective, both when working together and separately and have collaboratively created a field of text piracy research. Economists have described and analyzed the impact of shadow libraries on the publishing industry.

Sociologists of law and intellectual property researchers have analyzed digital piracy as a multifaceted phenomenon, showing how shadow libraries like Sci-Hub and Library Genesis have emerged as forms of resistance against perceived structural inequalities in academic publishing, while serving scholarly communities worldwide despite copyright enforcement efforts by publishers (Bodó and Poort, Forthcoming). Sociology overall has also contributed to further understanding of the social dynamics present behind the use and support of shadow libraries, as well as give indication on the broader societal impact their rise has created. The aforementioned Cybernormer project set out to do specifically this. A part of the project leveraged the user base of the Pirate Bay to create ResearchBay, a survey project which gave users of the Pirate Bay opportunity to understand their perspectives on social norms and copyright (Larsson et al., 2012)

In general, computer science has given the field of study a more robust understanding of the technological infrastructure which enables shadow libraries and other Black Open Access initiatives to operate and evolve, further bringing attention to how technology has been leveraged to challenge the academic publishing economy. Moreover, the field of media studies – and particularly media and communication studies, have given insights into how piracy reflects and influence cultural attitudes towards illicit file-sharing and how this differs

between media artifacts. The study of shadow libraries can, despite their narrow determinations in databases, not be reduced to one or two subjects. Instead, it should be viewed as a rich multidisciplinary tapestry, where almost every discipline has at least a minor interest in what effect shadow libraries have on their respective discipline, and how this effect has developed. But what distinguishes this dissertation, is its contribution to the two distinct fields already introduced: Media Studies and Library and Information Studies.

This interdisciplinary perspective allows us to examine shadow libraries through lenses typically applied to other media ecosystems, revealing patterns that transcend specific content types. Take, for instance, the so-called streaming revolution, which exemplifies the complex relationship between technological innovation and piracy practice. While new distribution platforms may initially appear to eliminate the need for unauthorized sharing, they often transform rather than eliminate informal distribution networks. This dynamic makes it clear that technological solutions to piracy simultaneously create new challenges and opportunities for both formal and informal media economies. The Pirate Bay, as an example, was for many years an invaluable source of music, TV-shows and film for large parts of the world and gave access to otherwise inaccessible media through the practice of piracy. With the introduction of services such as Spotify and Netflix, the need for Pirate Bay, seemingly diminished. This has been covered in a series of studies and news article – which heralded a new era of accessible media. As an example of the understanding of the view of media piracy in this context, one needs only to look towards the headlines in news media from the last decades: “Music piracy fallen dramatically over last five years thanks to streaming services such as Spotify and Tidal, survey reveals” (Shepherd, 2018); “Spotify Helps to Beat Music Piracy, European Commission Finds” (Van der Zar, 2015); “Video Killed the BitTorrent Star” (Neal, 2013). These viewpoints are distinctly rooted in what should be understood as a media and communication studies field, where the legal alternatives to a certain extent, succeed in curbing the need for media piracy, with their names even influencing how future businesses are shaped in a digital context. As Rasmus Fleischer (2021), has pointed out there has been a surge in businesses describing themselves as a “Spotify for x” where x represents any, often media-related, enterprise. Interestingly, companies using the music giant’s nomenclature rarely offer a gratis model for their users, but as Fleischer points to “the metaphoric meaning of “a Spotify” had lost its former association to claims like “\$0.00 is the future of business” (Fleischer, 2021). Regardless, any disputes on grounds of hypocrisy could easily be diverted

by claiming either that the future would hold a free version, or that they were simply a “Netflix for x” (Fleischer, 2021). Why then discuss these two companies in connection to the research field? Because this is an important, but flawed argument that is invoked when discussing academic text piracy. Toby Green has argued that the solution is the “unbundling” of the great deals, imploring the market to create user-tailored services to combat piracy (2017). However, there is a meaningful correlation between the business ideas and solutions for the troublesome economic disparity existing in digital literature. This is where the perspectives from library and information studies become essential to nuance the disparity between products of entertainment, and those of education and research. In text piracy, two distinct streams have emerged: entertainment-focused texts and educational or academic materials. While fiction and entertainment texts can serve academic purposes, giving them educational value in certain contexts, they operate in different markets than scholarly works. The academic publishing industry in particular has a unique structure, which researchers Larivière, Haustein, and Mongeon (2015) aptly characterized as an “oligopoly in the digital era,” where a small number of publishers control a large portion of the scholarly communication ecosystem. The problem itself is two-folded, one issue being concentration of research into fewer publishing houses, and the other is the exorbitant fees charged for the subscription. When relating back to the fields which this dissertation is situated in, it is important to recognize the particulars of the information studies field, especially with regard to Open Access publishing. The streaming revolution, exemplified by services like Spotify in music, initially appeared to disrupt traditional distribution models but actually reproduces many of the same control and distribution mechanisms found in traditional media industries, as scholars Eriksson et al. (2019) have demonstrated in their analysis of digital music platforms. Understanding that Open Access is subsumed under the same corporate direction as a company like Spotify is essential when studying the Black Open Access practices which are aimed at democratizing access overall. The comparison between Open Access and a tech company like Spotify might seem radical, but library scholars Fei Shu and Vincent Lariviere have investigated how the development of Open Access has reproduced an oligopoly of publishers in control of the prospective solution. In their results, they show that eight major Open Access publishers account for 70% of revenue whilst only producing a 30% share of the market (Shu and Lariviere, 2024). The synthesis between the two fields' perspectives – examining both control mechanisms and market logic in media distribution, while challenging the notion that educational materials deserve special treatment – this represents the theoretical

gap this dissertation addresses.

Pirate networks often develop sophisticated self-regulating economic systems that both challenge and mirror formal market structures. These communities establish internal pricing mechanisms through ratio requirements, create artificial scarcity through membership restrictions, and crucially, sometimes voluntarily limit their own activities to protect certain rights holders - suggesting a nuanced understanding of cultural sustainability that goes beyond simple opposition to copyright. This economic self-regulation demonstrates how pirate communities exist neither purely as resistance to formal markets nor as mere parasites, but rather as complex parallel economies that both compete with and complement traditional distribution channels. The development of these parallel economies has implications for both fields: For media and communication studies, it challenges assumptions about piracy being primarily oppositional or destructive, revealing instead how informal economies can foster new forms of cultural exchange and value creation. This insight builds upon extensive media studies research examining piracy's multifaceted social functions, including its democratizing potential (as highlighted by Andersson Schwarz, 2014), its role in fostering alternative distribution networks (Couto & Ferreira, 2019), and its capacity to serve marginalized communities excluded from formal media channels (Bendezu-Quispe et al., 2016). These perspectives collectively demonstrate how piracy operates not simply as resistance but as a productive force creating alternative infrastructures for knowledge circulation that both challenge and complement mainstream systems. Such nuance is particularly important when examining shadow libraries, which often explicitly position themselves as democratizing agents addressing structural inequalities in knowledge distribution.

For library and information studies, it suggests that the binary between Open Access and traditional publishing may be insufficient, as pirate communities develop their own hybrid models of restricting and enabling access. This extends the field's understanding beyond institutional approaches to knowledge dissemination (as shown by Hoy, 2017; Boudry et al., 2019), incorporates insights about information equity across global contexts (Bodó et al., 2020; Singh et al., 2021), and recognizes how shadow libraries have become embedded within legitimate scholarly workflows (Correa et al., 2022). These perspectives collectively demonstrate how informal knowledge distribution systems operate not just as alternatives to

traditional libraries but as complementary infrastructures addressing gaps in the formal scholarly communication ecosystem.

My dissertation's contribution is thus twofold: to media and communications studies it brings attention to text piracy as a distinct form of media piracy with its own economic and social dynamics, moving beyond the typical focus on music and film sharing. To library and information studies, it demonstrates how pirate communities' economic self-regulation and community governance offer insights for understanding emerging models of scholarly communication and access. By bridging these perspectives, the intention is to accentuate how text piracy exists at the intersection of media economics, information access, and community formation - suggesting that future research and policy must engage with both its economic and social dimensions rather than treating it as simply a legal or technological problem. This dual disciplinary contribution opens new avenues for understanding how informal media economies operate in the digital age. As both fields grapple with ongoing changes in how cultural goods are produced, distributed and accessed, the study of pirate communities' parallel economies offers valuable insights into possible futures for both media studies and LIS. A final ambition and contribution is to connect the two fields which rarely meet, despite having many similar interests and intersections.

3. Capturing Shadows: A Methodological Patchwork

Each of the articles that comprise this dissertation contains its own detailed methods section specific to each study. Consequently, this overview focuses on the broader methodological approach that unifies the individual studies and demonstrates how different methods work together to address the dissertation's research question

The very nature of shadow libraries mimics that of the shadow. And just as the gathering of shadows may seem like an insurmountable task, data collection and analysis of shadow libraries has been equally as hard. Just like shadows, these sites have a fleeting and elusive character, they seem to stretch into infinity and diminish on a whim. So, when I began studying shadow libraries I was swiftly met with unique methodological challenges. To overcome this, it was of essence that I worked flexibly, allowing myself to explore diverse analytical methods throughout the process that resulted in this dissertation. This meant

combining methods with the intention of capturing data where it could be found, and when found, analyzing it in ways which respected what I had caught. The choices that I made when approaching the topic of shadow libraries in this exploratory, but pragmatic way, resulted in a dynamic methodological framework create several minor in-ways which together form an overarching toolbox for engaging with and capturing the dynamic nature of a shadow library ecosystem. The methods include text analysis, automated text analysis, netnography, and computational tools, each selected to address specific aspects of shadow libraries and Black Open Access.

In the early stages of working with this dissertation, I took part in a course on digital humanities. As part of the course, I was introduced to new ways of understanding data collection and analysis. The one which turned out to be of particular importance for me and this methodological patchwork was Johanna Drucker's notion of "capta". She argues that data, as understood in humanistic inquiry, tends to be presented as pre-existing, neutral and largely self-evident (Drucker, 2011). When analyzed, she argues that data becomes perceived as independent of its observer and transparent (Drucker, 2011). To exemplify why this perception is skewed, she returns to the Latin root of the word data: datum, which means given. A fact which she claims has shaped the relationship to data collection, analysis and visualization. Instead, she suggests the term capta, Latin for *taken*, which better reflects the process of interpretation which is present in humanistic analysis. The foundation of my methodological approach is built on this very principle. As such, the development of the aforementioned patchwork is an attempt at capturing representative aspects of shadow libraries and black Open Access activities. The distinction between data and capta has been especially crucial when examining digital spaces that actively resist conventional research methods. Shadow libraries, by their nature, often employ mechanisms to avoid detection and analysis, making data collection insufficient or impossible. By viewing information gathering as an active process of capture rather than passive collection, I view the methodological roads taken as ways to use differing methods which capture these elusive digital spaces in a meaningful manner.

In the dissertation, the implementation of capta as a methodological principle manifested in several ways throughout my research process. For example, when I was mapping the network of shadow libraries and their connections, for article II in this dissertation, I had no possibility

of traditional API access. Instead, I was pushed towards alternative methods of data capture. This included web crawling with careful curation of web entities to maintain research validity. This approach to data as *capta* influenced not only the collection methods but also the analytical framework, encouraging a more nuanced understanding of how information is extracted from resistant digital spaces. This stance has been replicated throughout the different methodological choices.

Text analysis has served as a primary method for encoding and comprehending textual components of shadow libraries, and their representation in media. This approach entailed qualitative exploration and interpretation of text to gain insight into themes, ideologies, and motivations found on Black Open Access platforms, adjacent communities, and in legacy news media, as seen in article III, IV, and V. The text analysis process involved multiple layers of examination, from surface-level content analysis to more semantic interpretation, allowing for the identification of recurring themes, ideological positions, and motivational factors that drive participation in shadow library communities. Text analysis also involved the use of computational tools which augmented my analysis, helping to extract patterns, and topics from Black Open Access communities and shadow library usage data, as exemplified in article III. The various tools employed enabled me to process large volumes of textual data that would be impractical to analyze manually, while also revealing patterns and connections that might not be apparent through close reading alone. In all cases the idea of *capta* was ever present, when combining manual and automated analysis I was provided with insights that neither method alone could have achieved, creating a more comprehensive understanding of how shadow libraries operate and how their communities interact. The implementation of netnographic methods particularly demonstrates the value of viewing data collection as an active process of capture. Through sustained engagement with shadow library communities this methodological approach revealed several key aspects of the communities that might have remained hidden through other approaches, or if the data provided by shadow libraries was trusted at face value. By participating in these communities, it became possible for me to understand the social norms, unwritten rules, and community dynamics that govern these spaces. This insider perspective provided crucial context for interpreting quantitative data and understanding the motivations behind user behaviors, and in extension reflect over that which was given (*data*) and that which was taken (*capta*).

As I have briefly touched upon, this dissertation includes a variety of computational tools – both for collecting data and analyzing it. I selected them for specific capabilities that addressed different aspects of shadow library research. Web crawling using the Hyphe tool enabled the mapping of relationships between actors and analysis of interconnectedness on platforms that don't support API extraction. This tool proved particularly valuable for understanding the network structure of shadow libraries and their connections to other online spaces. Hyphe is a web crawler developed at the Sciences Po medialab with a curation-oriented approach specifically designed for social science research (Jacomy, et al., 2016). It allows its users to harvest content and hyperlinks from webpages, aggregating them as "web entities" to reduce data complexity. In its essence, Hyphe is a tool which is user-centric, only performing actions when commanded by the user, and provides feedback for monitoring its processing. Jacomy and colleagues detail the obstacles faced by scholars when using existing web crawlers for social science research, such as translating research questions into technical web-mining environments, controlling selection criteria, and dealing with the heterogeneous granularity of actors' presence on the web (Jacomy et al., 2016). Hyphe addresses these issues by allowing scholars to curate their own web corpora, enabling them to map relationships between actors and analyze interconnectedness on platforms that do not support extraction via an API. This is especially useful when conducting research on sites such as shadow libraries, which in part rely on being difficult to interact with from the outside. The authors emphasize that Hyphe focuses on quality rather than performance, as it is time-consuming but ensures reliable and interpretable results for social science research. Hyphe is not intended to replace other tools but to unlock new methodologies for studying the generic web, including small and API-less platforms crucial for studying marginal communities or weak signals. Using Hyphe to build a network of shadow libraries proved to be the perfect measure for capturing the data which I sought to interpret. Building a network based on my curated web crawls enabled a measured methodological approach combining close and careful investigation of the actual shadow library sites paired with computationally generated overviews.

The implementation of computational methods did not end with Hyphe but came to play some part in articles II, III, IV, and V. Most of the tools employed were used within the python programming language. I used several different python libraries throughout my doctoral period, but the most important for analysis were matplotlib, pandas, and folium which helped me facilitate the creation of visual representations such as histograms, maps, and pie charts.

This in turn aided in visualizing and understanding user distribution, download patterns, and subject interests within shadow libraries. These visualizations served multiple purposes: they facilitated the interpretation and construction of patterns from data that was captured, supported the communication of findings, and enabled the discovery of relationships that might not be apparent in the data taken. The computational analysis also extended statistical measures to include more sophisticated approaches to data interpretation. Network analysis revealed patterns of connection and influence between different shadow library platforms and their associated communities. Geographic analysis helped understand the distribution of shadow library usage. All computational collection and analysis were paired with netnographic methods to further assess Black Open Access in relation to various factors such as internet access, academic institutions, and local copyright laws.

The netnographic dimension of my research provided insights into the internal dynamics of shadow libraries and their adjoining communities, seen in article I, III, and V. This methodological approach involved systematic observation and participation in these digital spaces, including engagement through both downloading and uploading of materials (within legal parameters), as seen in article I. My use of netnography developed alongside the Hyphe tool. While Rogers' *Doing Digital Methods* primarily focuses on different analytical approaches, his concept of “associative query snowballing” for creating and curating network analyses proved influential to my methodology (Rogers, 2019, p.99). What served as the impetus was Rogers arguing for the importance of complementing more automated methods with reading and engaging with the sites that are crawled, creating a more intimate connection with the networks. This, in turn, invariably led me into netnographic analysis, particularly influenced by Robert Kozinets. Kozinets, albeit dated, clearly espouses the need for findings rooted in the data, which forces researchers to engage in the digital milieu equivalent to the participants in that community (Kozinets et al., 2014). The implementation of netnographic methods required careful navigation of ethical boundaries, particularly given the legal grey areas in which these communities operate. While direct engagement with platform administrators proved challenging, these limitations ultimately enriched the methodological framework by necessitating alternative approaches to understanding community dynamics, showing that my own brand of capta was as much a theoretical as a pragmatic measure. This adaptation exemplified the flexibility required when studying shadow libraries, as each

methodological challenge presented opportunities for developing novel approaches to data capture and analysis.

Netnography was not the only qualitative method employed, many of the articles in this dissertation include section of text analysis. Analyzing text further proved to be important as a unifying method between qualitative and quantitative methods, as I integrated both distant and close reading techniques. For this, I drew inspiration from Moretti's conceptual framework, employing distant reading to analyze extensive collections of community comments and discussions, enabling the identification of broader patterns and trends across textual datasets (Moretti, 2013). Close reading was then used to gain more nuanced insights into the perceptions, motivations, and discussions within discursive themes identified. The combination of these approaches allowed for a multi-layered understanding of shadow library culture and usage patterns, revealing both macro-level trends and granular details about behavior and discourse. Both distant and close reading proved particularly valuable in understanding how shadow libraries are perceived, and gave indication of their cultural norms, technical practices, and ethical frameworks.

The application of this methodological framework revealed distinct aspects of shadow libraries across the dissertation's articles. The investigation of Swedish piracy patterns required a historical analytical approach, examining datasets that revealed the development of text piracy and its international connections. This analysis shows how the relationship between formal and informal media economies affects legislative frameworks and consequently how ideological factors have shaped illicit file-sharing initiatives. The Swedish context served as a valuable lens through which to understand the development of shadow libraries within specific cultural and legal frameworks, while simultaneously demonstrating their inherently global nature. This historical perspective provided crucial insights into how shadow libraries evolve in response to changing legal, technological, and social conditions, offering valuable lessons for understanding their contemporary manifestations. In examining decentralized digital preservation, in article II; the methodological framework enabled mapping of intricate connections between shadow libraries and adjacent forums. This revealed how the LOCKSS (Lots of Copies Keep Stuff Safe) methodology functions as a cornerstone for ensuring shadow library longevity while exposing crucial aspects of informal media distribution. This research component demonstrated both the technical infrastructure

supporting shadow libraries and their adaptive mechanisms for ensuring content preservation in the face of legal and technical challenges. The exploration of these preservation strategies highlighted the technical and social systems that shadow libraries develop to maintain their collections and communities. The findings highlighted how these platforms serve essential needs within professional communities, adding nuance to discussions about access to scientific literature. This investigation of professional usage patterns and motivations demonstrated the complex ways in which shadow libraries intersect with formal academic and professional institutions.

Building on these methodological considerations, the patchy framework which I developed and used when working with this dissertation, embraces the inherent challenges in studying ephemeral and sometimes secretive online communities. By integrating quantitative and qualitative approaches, I was able to examine both broad patterns and specific instances of user behavior, content distribution, and discursive dynamics. The ethical considerations within this dissertation were approached as relational rather than strictly formalist. This acknowledges the complex ethical landscape of studying potentially illegal activities while maintaining research integrity and contributing to academic understanding of these important digital spaces. The flexibility inherent in this methodological patchwork makes it well-suited for studying other forms of informal media economies, which will be discussed in the next section, and digital communities operating in legal and ethical grey areas. Combining traditional and computational methods allowed for an awareness of the active nature of data capture, and engaging directly with these digital spaces. This framework provides a comprehensive approach to understanding shadow libraries and their implications for knowledge access. This patchwork methodology represents a contribution to the study of digital piracy and the informal media economy, creating a framework capable of adapting to the challenging nature of studying shadow libraries. The framework's success in revealing multiple aspects of shadow library operations suggests its potential value for future research in this and related fields, particularly as digital spaces continue to evolve and present new methodological challenges for researchers.

This methodological patchwork is ultimately designed with the intention of answering the dissertation's research questions. The combination of computational tools and netnographic methods helps reveal how formal and informal media economies intersect in Black Open

Access (RQ1). Text analysis and community observation shows how Black Open Access communities are created and sustained (RQ2). Finally, the integration of close and distant reading techniques helps uncover how users justify and motivate their use of shadow libraries (RQ3). Together, these methods provide multiple perspectives on the complex phenomenon of Black Open Access, while allowing individual articles to dive deeper into specific aspects through their own methodological approaches.

4. Theory

This dissertation is informed by two theories which together make up the framework that provides the needed nuanced understanding of the complex landscape of illicit text dissemination and shadow libraries. The concept of informal media economy, as articulated by Lobato and Thomas (2015), offers the main theoretical underpinning for analyzing the intricate relationship between formal and informal media economies. The theory gives insight into the often overlooked symbiosis between unauthorized sharing practices and mainstream media industries, providing crucial insights into the emergence and proliferation of phenomena such as the Black Open Access initiatives and shadow libraries. Complementing this perspective, is Boltanski and Thévenot's (2006) theory of regimes of justification which contributes a series of analytical tools for examining the moral and ethical dimensions of Black Open Access. This theoretical lens allows for an exploration of the diverse rationalities and justifications employed by individuals engaged in illicit file-sharing, offering a more comprehensive understanding of the moral reasoning that underpins these practices. Together, these theories provide the foundation for investigating the multifaceted nature of shadow libraries, encompassing their economic, social, and ethical implications in the digital age.

4.1 Informal Media Economy

The concept of the formal and informal media economy, as detailed by Lobato and Thomas (2015), highlights the complex interrelationship between regulated and unregulated parts of the media ecosystem and how they mutually influence each other. The informal economy, however, should be understood in a much wider spectrum than file-sharing online. It stretches from street vendors selling bootleg DVDs, to underground labs making pharmaceuticals. At its core, the informal media economy revolves around economic exchanges and communication flows that operate in unregulated spaces. These flows are not merely relegated to the fringes of the media landscape but are deeply embedded in mainstream media

industries, often in ways that go unnoticed. In *Subcinema*, Lobato argues that the informal flows, at times, act as predecessors to formal media economy (2011, p. 114). For instance, platforms like iTunes or Spotify owe their genesis and evolution to free software cultures, MP3 file-sharing, and hacker communities. Such interdependencies underscore the significance of informal media practices in shaping the formal media economy. The relationship between informal sharing practices and formal business models has been analyzed in recent scholarship. Rasmus Fleischer's research on the Spotify business model particularly demonstrates how legitimate services can emerge from and adapt to informal distribution practices. Fleischer's research demonstrates how Spotify's business model fundamentally relied on and incorporated elements from informal file-sharing networks, effectively transforming piracy-inspired distribution mechanisms into a commercially viable platform while simultaneously reshaping user expectations about music access and consumption.

When applied to the realm of text piracy, the informal media economy offers a lens through which we can understand the emergence and proliferation of Black Open Access, shadow libraries, and their adjoining communities. The relationship works bidirectionally: formal services like iTunes or Spotify initially capitalized on unauthorized sharing practices to revolutionize music distribution, while shadow libraries both draw from and contribute to formal academic structures. These libraries not only utilize informal channels for knowledge distribution but also serve professional academic needs, influencing citation patterns and research accessibility in formal settings (Buehling et al., 2022). This reciprocal relationship highlights how the boundaries between formal and informal knowledge economies are increasingly blurred in academic publishing. The informal media economy for text is neither a recent phenomenon nor confined to digital space. Historically, unauthorized retransmissions of broadcasts, unlicensed printing, and parallel importing of books have all been facets of the informal media economy. The examples in this dissertation's previous research serve as illustrative of this. Take for example the aforementioned samizdat practices during the Soviet Union, i.e. the clandestine publishers that circumvented the censorship prevalent throughout the Soviet Union, or the history of unlicensed printing, which stretches even further back (Bodó, 2018a; Darnton 2021). Samizdat publishing, is also to a degree, credited with the proliferation of large Russian shadow library initiatives such as Library Genesis (Bodó, 2018a). Robert Darnton has argued that the spread of enlightenment ideas can be partially

attributed to the informal publishing of *contrefaçons*, throughout France and western Europe (Darnton, 2021).

While often operating on the margins, these practices have invariably influenced mainstream media and economic development. In the context of academic text dissemination, shadow libraries can be seen as modern manifestations of these historical informal practices. They serve as repositories of knowledge by bypassing traditional academic gatekeeping mechanisms and democratizing access to information. While these communities might operate outside the formal structures of academic publishing and copyright, they play a crucial role in shaping academic discourse, much like their counterparts in the formal sector. Bodó has described Black Open Access as “alliance of scholars in the global centers and at the global peripheries” (2016b). Furthermore, the global nature of the informal media economy mirrors the transnational character of shadow libraries, as displayed in the vast language selections found on the sites, or online communities with users from around the world, which is further exemplified in article I, III, IV and V. These communities are not bound by geographical or institutional boundaries, fostering a global (albeit western-centric) academic collaboration. Consequently, viewing shadow libraries as aspects of an informal media economy provides a foundation for understanding the dynamics of text piracy. By recognizing the reciprocal relationship between formal and informal economies, deeper insights into the transformative potential of shadow libraries can be gained, especially with their effect on academic discourse in the digital age.

The spectrum of formality is a central theoretical concept in understanding the dynamics of shadow libraries and Black Open Access initiatives. Rather than viewing formality and informality as binary states, it is instead viewed as a continuous range that varies in scale and level of organization. This is evident in the diverse structures and user bases of different shadow library sites, some of which may lean closer to formal rather than informal practices, and vice versa. In article I, Z-library’s aesthetic choices reflect the blurry boundaries of what is considered formal and informal markets. Making a site with functions and design choices which are intended to bring in and maintain users will inevitably emulate the formal market’s strategies (Lobato and Thomas, 2016). Closely related to this spectrum is the interdependence of formal and informal sectors, linked by scaffolding between them. This concept is applied to illustrate how the informal spectrum can act as an incubator for formal practices, and how

formal media economies often have their roots in informal practices. It emphasizes that informal media practices are not mere appendages but actively shape and influence the formal media economy. In article II, the analysis of the network of shadow libraries and their extensions into formal media structures, such as Wikipedia, Reddit, Facebook, or Google, further reinforces the theoretical argument that underpins the informal media economy – its fundamental inseparability from formal economic systems. An important aspect to consider is the global reach of these informal media activities. When examining shadow libraries and Black Open Access initiatives, taking a global perspective becomes essential for understanding how these systems operate across different contexts. This approach helps highlight significant disparities in information access that exist worldwide, particularly due to limitations within formal media economies. Spatial dynamics play a significant role in shaping formality and informality within local contexts. Simultaneously, shadow libraries challenge traditional spatial dynamics by transcending geographical and legislative borders, fostering global participation and distribution. The concept of regulation and governance is applied to demonstrate how the absence of regulation can have various effects on informal media economies, ranging from freedom to potential abuse. This aspect of the theory also lends credence to the resilience of shadow libraries, as attempts to regulate their activities often spur both social and technological innovation within these platforms, as seen in article II. The ideas of branding and legitimacy are closely interconnected with mimicry, leveraging formal media economy strategies and blurring lines between the formal and informal, become important aspects for Black Open Access initiatives, which is made clear in article I. These strategies are employed to inspire user trust and proliferate throughout the web, further illustrating the complex relationship between formal and informal sectors in the digital information landscape. While not extensively covered in the previous research section, Lobato and Thomas's informal media economy framework has been productively applied to piracy contexts by Kunze (2023), who used this perspective to examine how bootleg musical theatre recordings circulate through digital channels. Similarly, Llamas-Rodriguez (2019) extends this framework by conceptualizing 'feeling pirate' as an affective experience within minoritarian media consumption, showing how informal media practices can create spaces that both reflect and reinforce certain communities' precarious social positioning. These applications demonstrate the framework's utility for understanding how pirate communities balance illegality with legitimation practices across diverse media contexts while also highlighting the affective dimensions of participating in informal media economies.

4.2 Regimes of Justification

In addition to the perspective of the informal media economy, the concept of regimes of justification, as articulated by Boltanski and Thévenot (2006), is the second theoretical perspective in this dissertation. Its purpose is to create an understanding of the moral and ethical justifications behind Black Open Access. This theory emphasizes a systematic reflexivity on how individuals motivate their behaviors and justify their actions. Regimes of justification classify the structure of justifications into one of six worlds or “orders of worth,” which effectively are aspects of the social world from which justifications are derived (Boltanski and Thévenot, 2006). Each order of worth intrinsically denies others, creating a complex landscape of moral reasoning. The six “orders of worth” or “worlds” are: market, industrial, civic, domestic, inspired, and fame/opinion. These orders effectively represent aspects of the social world from which justifications are derived. This framework allows for a nuanced analysis that bridges micro-level individual justifications with macro-level social structures and values. In the market world, worth is determined by price and competitiveness. The industrial world values efficiency and productivity. The civic world prioritizes collective welfare and formal rights. The domestic world emphasizes personal relationships and tradition. The inspired world values creativity and authenticity. Finally, the world of fame or opinion bases worth on public recognition and popularity (Boltanski and Thévenot, 2006). Central to the theory is the concept of “tests” – situations or criteria used to evaluate worth within each order. Such tests become particularly significant in moments of dispute or controversy, where actors must justify their positions (Boltanski and Thévenot, 2006, p.133-114). The theory also explores how compromises between different orders of worth are constructed and stabilized, offering insights into organizational and institutional change.

In the context of text piracy, regimes of justification offer insights into how individuals engaged in these practice reason their involvement. File sharers often present coherent arguments that underscore the societal benefits of their activities, as show in article III. This mentality, rooted in a belief in democratized access to information, resonates with the ethos of shadow library communities. These communities, while operating in the gray areas of legality, champion the cause of Open Access and knowledge dissemination. This is most evident in the open calls and active ideological debates set forth on platforms like Z-library, Libgen, and the operator of Sci-Hub, Alexandra Elbakyan. By working with Boltanski and

Thévenot's conception of justification, I can gain a deeper understanding of the development of text piracy. Regimes of justification give insight into how it can be justified in terms of democratization, as resistance, or as an incubator for innovation. It can also be useful in understanding the opposing side regarding the protection of intellectual property. In the case of democratization of dissemination, text piracy can be understood along the same lines as what Boltanski and Thevenot dub "the civic world," which would see piracy as a civic duty to ensure that all citizens have access to entertainment, or in the case of this article, academic literature. As resistance, piracy would be situated within the inspired world where part of the justification lies in breaking free from social norms, such as the normative aspects of copyright. Essentially, the practice of piracy can be understood through different orders of worth, providing a useful framework for analyzing how they are presented in discussion, media outlets, or in the shifting patterns of download behavior. The theory's strength lies in its ability to explain how actors navigate complex situations involving multiple competing values and rationalities. It reveals the micro-level processes of critique, justification, and agreement through which social coordination is achieved, without privileging any one perspective. This makes it particularly suitable for analyzing the multifaceted phenomenon of Black Open Access, where legal, ethical, and practical considerations often conflict. However, it is important to note that the economies of worth framework is not without limitations. Critics have pointed out its potential to overlook power dynamics and structural inequalities, which in part is ameliorated in this dissertation by the inclusion of perspectives from informal media economy.

The dissertation operationalizes a few central concepts from the theory. Orders of worth offers structure for comprehending how users of shadow libraries justify their actions based on differing moral principles. The perspective will aid in arguing how users of Black Open Access and shadow libraries present multifaceted arguments to justify their use. It aids in underpinning the assertion that the use of, for example, shadow libraries is not a simple legal or ethical issue, but rather a complex social phenomenon drawing upon a variety of moral and logical frameworks. In article IV, this is illustrated by connecting Sweden's particular legislative and ideological roots to justifications which have motivated the creation and spread of illicit file-sharing initiatives. The concepts of critique, competence and compromise add another layer to this analysis. Critique refers to the dynamics inherent in justification, which, together with compromise, allows for arguments that are fluid in relation

to their context. In this framework, pirates exhibit themselves as morally diverse actors when they draw on multiple orders of worth to navigate complex socio-legal situations (Boltanski and Thévenot, 2005). The notion of common good is fundamental to Boltanski and Thévenot's theory, as each order of worth has it as their ultimate objective. By applying these interconnected concepts, a more nuanced understanding of the justifications and motivations behind the use of shadow libraries and participation in Black Open Access initiatives is achieved. This theoretical framework adds weight to reasoning beyond simplistic legal or moral judgments, viewing these practices as complex social phenomena. This approach aligns with previous research by Andersson Schwarz and Larsson (2014) and Andersson Schwarz (2018), who similarly examined the nuanced justificatory frameworks that pirates construct. By applying regimes of justification theory to Black Open Access, this dissertation extends these earlier approaches to the specific context of academic text piracy.

4.3 Theory in Context

The theoretical framework of this dissertation rests on two complementary perspectives that together provide a comprehensive lens for understanding shadow libraries and Black Open Access initiatives: the informal media economy (Lobato and Thomas, 2015) and regimes of justification (Boltanski and Thévenot, 2006). These theories enable the analysis of both the structural dynamics and moral dimensions that characterize the landscape of illicit text dissemination. The concept of informal media economy shows the reciprocal relationship between formal and informal sectors in media distribution. Rather than viewing shadow libraries as an isolated phenomena existing on the fringes of academic publishing, the perspectives gathered from Lobato and Thomas show that they are interconnected with mainstream media industries. The spectrum of formality, a central theoretical concept in this framework, recognizes that shadow libraries exist along a continuum rather than in a binary state of formality/informality. This is evident in for example article I, where Z-library's aesthetic choices reflect the blurry boundaries of what is considered formal and informal markets. Making a site with functions and design choices which are intended to bring in and maintain users will inevitably emulate the formal markets strategies (Lobato and Thomas, 2016). The gamification elements and user classification as librarians further illustrate how shadow libraries appropriate formal sector terminology and practices to establish legitimacy. This interdependence is shown in article II, where the analysis of the network of shadow

libraries and their extensions into formal media structures, such as Wikipedia, Reddit, Facebook, or Google, gives further weight to the theoretical argument which underpins the informal media economy – its inseparability with the formal.

The LOCKSS-inspired methodology adopted by many shadow libraries exemplifies how principles developed within formal academic contexts can be repurposed within informal networks to ensure sustainability and resilience. The global nature of this informal economy is exemplified in article III, which show how scholars discuss their reliance on shadow libraries to perform their day-to-day work. This further shows how the reliance on platforms in, and the use of informal media sources plays significant roles in sustaining work which is later disseminated through formal channels. The relationship is further exemplified in the materials, especially when regarding one of the major pitfalls of informality – the absence of marketing, regulation or frameworks of protection. From this perspective, the formal sector can act doubly as a layer of protection and a marketing tool, where the Reddit subforum themselves are examples of this. Article IV further demonstrates the historical dimension of the informal media economy by revealing how it sprouts and grows within a national context, and how Sweden's particular legislative and ideological roots have created justifications which have motivated the creation and spread of illicit file-sharing initiatives. The Swedish context acts as a unique example internationally, partially due to the technological infrastructure, which saw early implementations of high-speed internet. Moreover, the shift from formerly formal to informal (by illegalization) practices in Sweden demonstrates the fluid nature of these boundaries, as previously legal copying of books from libraries became restricted through new legislation in 2005.

Complementing this structural analysis, the regimes of justification theory provides analytical tools for examining the moral reasoning behind participation in shadow libraries. In article III, users frequently invoke the civic order of worth, which emphasizes democratization and collective welfare. The civic order of justification is particularly prominent in article IV, where the creation of the Swedish Pirate Party serves as an excellent example of how this argument was conceived. It was done by leveraging the idea of a collective public and their personal security online, a question that came to the forefront when The Pirate Bay was raided due to requests from the Motion Picture Association of America. Protecting the public, as a collective, from similar inquisition was therefore vital not just for the party's own politics, but

pirate ideology overall. Article II, focusing on the LOCKSS initiative and its relationship to shadow libraries, demonstrates how the radical openness inherent in almost all shadow library projects can be both an ideological strength and a vulnerability. The possibility to freely create copies of shadow libraries is shown to be detrimental in certain cases, where false versions of shadow libraries are published with ads or malware. This finding unveils one of the more negative, but central, aspects of informal media distribution: lack of regulation. Shadow libraries are shown to operate within complex ecosystems that blend formal and informal elements, challenging simple categorizations. The justifications for participating in shadow libraries are multifaceted, drawing on diverse moral principles that extend beyond mere economic considerations. Users navigate complex socio-legal situations by employing multiple modes of justification, revealing them as morally diverse actors rather than simple law-breakers, as article III and V makes explicit. The combined theoretical framework of informal media economy and regimes of justification provides a basis for understanding shadow libraries as complex social phenomena embedded within broader economic, ethical, and cultural contexts.

5. Article Presentation

Article I:

Gamifying Piracy: Functions and Users of the Z-library

Published in Journal of Documentation.

In this I article investigates how Z-library employs gamification techniques to sustain and grow its illegal repository of literature. Through a netnographic approach, combining walkthrough methodology and technographic analysis. This article shows how Z-library's carefully designed interface and functionality system motivates users to contribute to building the world's largest e-book library. Three distinct user categories are identified which interact with the platform in different ways: "bare-minimum users" who simply download specific items, "intermediate users" who occasionally engage with additional features, and "prolific users" who actively contribute through uploading, editing, and social interaction. These user behaviors are shaped by three types of platform functions: manual functions requiring active input, automatic functions operating in the background, and social functions enabling user interaction. A key finding is how Z-library successfully gamifies piracy through a

sophisticated reward system that includes points, leaderboards, and tiered membership levels. This gamification serves multiple purposes: it motivates users to contribute, creates a sense of legitimacy through professional design, and bridges individual motivations with collective goals. The platform achieves this while maintaining an aesthetic similar to legal sites thus blurring the lines between legitimate and illegitimate practices.

In Article I, the concept of "gamified piracy" is introduced to explain how illegal platforms can sustain operations through distributed user labor while maintaining an appearance of legitimacy. This theoretical contribution provides a new framework for understanding how shadow libraries operate and grow. While the findings are specific to Z-library, they offer valuable insights into the evolution of digital piracy platforms and the role of user engagement in maintaining illegal repositories. Furthermore, this article demonstrates how Z-library has effectively transformed the complex task of running a massive digital library into a gamified system that encourages user participation at various levels. This approach has proven successful in creating a sustainable model for illegal content distribution, raising important questions about the future of digital libraries and content access.

Article II:

Decentralized Digital Preservation: The LOCKSS Initiative and Shadow Libraries

Published in Online Information Review

In this article I examine how shadow libraries utilize distributed preservation techniques, inspired by Stanford University's LOCKSS (Lots of Copies Keep Stuff Safe) methodology, to ensure their continued existence. I specifically investigate how these platforms maintain connections with each other and evade legal consequences through a network analysis approach. Using the web crawler Hype, the article maps the link structures between various shadow libraries including Sci-Hub, Library Genesis (LibGen), and Z-library, as well as their connections to mainstream platforms. The analysis reveals that shadow libraries employ what I have designated as "Pirate LOCKSS": This is a methodology that combines multiple domain copies with strategic use of established internet infrastructure to ensure survival. However, this approach also has drawbacks, as it enables the creation of malicious copies that exploit the shadow library ecosystem for personal gain. A key finding is that shadow libraries

maintain persistence not only through domain multiplication but also by leveraging major platforms like Wikipedia, Reddit, and Twitter as stable central nodes, or intermediaries. These platforms serve as reliable entry points and information hubs about active shadow library domains, effectively creating a paradoxical decentralized yet centralized network. The findings shows how shadow libraries have become embedded in academic practice, evidenced by acknowledgments in published papers and their integration into scholarly workflows.

Additionally, Article II contributes to ideas surrounding digital preservation and information infrastructure by examining how informal networks can appropriate and adapt formal preservation methodologies. It demonstrates how shadow libraries have achieved a form of infrastructural inversion in academic information access, creating alternative pathways for scholarly communication that persist despite legal challenges. This article, more than any others in this dissertation, serves as a starting point in several directions for future research. This includes examining the impact of fake or poor copies on user trust, investigating the evolving relationship between traditional and shadow libraries, and analyzing how pirate platforms adapt to survive against legislative threats.

Article III:

"Why does pirating papers feel so good": Analyzing Shadow Library Communities on Reddit In Review First Monday

The third article sets its sights on the dynamics of shadow library communities on Reddit. In the article I focus on how users engage with and justify their participation in academic text piracy. Using computational tools I analyzed posts and comments from four subreddits (r/scholar, r/zlibrary, r/scihub, and r/libgen) dedicated to shadow libraries and academic content sharing. The results identify complex patterns of user behavior and justification within these communities. A particularly interesting finding is the communities' response to external threats, such as the FBI's seizure of Z-library, which revealed strong solidarity among users and knowledge-sharing about alternative access methods. Article III also highlights how Reddit communities serve as scaffolding for piracy, providing guidance on security measures and helping users distinguish between legitimate and fraudulent sources. Additional findings show that users often frame their participation in shadow libraries through a moral lens, positioning access to knowledge as a fundamental right that transcends legal boundaries. This

justification framework draws heavily on ideals of knowledge democratization and societal benefit, allowing users to rationalize their engagement with illegal content sharing. This article empirically illustrates the interplay between formal and informal media practices, where users navigate between traditional academic resources and shadow libraries based on necessity and accessibility. Methodologically, the study employs a combination of distant and close reading approaches, analyzing over 46,000 comments through topic modeling and sentiment analysis. The findings indicate that discussions in these communities generally maintain a positive or neutral tone, even when addressing controversial topics. Users demonstrate strong community support, sharing technical knowledge about secure access methods and helping others navigate potential risks associated with shadow library use.

The article contributes to the body of research on of informal media economies and digital piracy by showing how users justify and normalize their participation in shadow libraries. These communities are not merely focused on accessing free content but are underpinned by complex moral frameworks and technical expertise. Additionally, it provides insights into how social media platforms can facilitate access to pirated academic content while also serving as spaces for community building and knowledge sharing. Furthermore, the results highlight the tension between democratizing knowledge access and copyright protection in academic publishing, suggesting that shadow libraries have become deeply integrated into academic information dissemination for certain user groups, and in doing so it acts as a companion piece to the first article in the dissertation: *Gamifying Piracy*. The findings have implications for understanding how informal media practices continue to shape and challenge traditional academic publishing models.

Article IV:

Patterns of Piracy: Sci-Hub and Sweden 2011-2018

Published in Internet Histories

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The dissertation's fourth article, zooms in geographically while zooming out temporally. In "Patterns of Piracy: Sci-Hub and Sweden 2011-2018," I examine the evolution of academic text piracy in Sweden through the lens of two shadow libraries: Sci-Hub and Library Genesis. The article examines historical download data spanning from 2011 to 2018, combined with media coverage analysis, to understand how text piracy has developed in a Swedish context.

Article IV employs the same two theories which act as the foundation in the dissertation: Lobato and Thomas's concept of informal media economy and Boltanski and Thévenot's regimes of justification. Through these frameworks, the study reveals how Swedish text piracy is deeply intertwined with academic work and institutional practices. The analysis demonstrates that early Swedish Sci-Hub users showed particular interest in chemistry-related downloads, which later shifted toward medical fields by 2017. This evolution occurred against the backdrop of Sweden's unique digital culture, characterized by early innovations in file-sharing and a strong tradition of internet freedom.

A significant finding is the geographical distribution of downloads, which shows concentration in university towns and major cities, but also reveals unexpected usage patterns in non-university areas. The temporal analysis indicates that most downloads occurred during typical working hours, suggesting that users tend to download while at work. The study also examines the role of key events, such as the BIBSAM consortium's cancellation of their Elsevier agreement in 2018, which led to increased shadow library usage among Swedish researchers. The article contributes to understanding how different actors - including researchers, libraries, and private companies - formed loose collaborations in response to perceived publishing industry injustices. This is exemplified by the case of Swedish internet service provider Bahnhof's protest against the Dutch publisher Elsevier's domain blocking demands. Additionally, this article demonstrates how text piracy differs from other forms of digital piracy, being more closely aligned with professional academic work and institutional needs rather than entertainment consumption. The article concludes that text piracy in Sweden has a unique character shaped by the country's digital culture, academic institutions, and broader discussions about information access. It shows how informal and formal media economies intermingle in academic contexts, creating complex patterns of justification and use that go beyond simple unauthorized access to include questions of academic freedom, institutional resources, and public access to research.

Article V:

Exploring the Relationship between Sci-Hub and Medical Literature

Published in: ASIS&T Annual Meeting 2023 proceedings

In Article V I examine the connection between medical professionals and their use of Sci-Hub. Rather than working theoretically, article V was a methodological experiment. The

experiment conducted was an analysis of data collected by scraping Sci-Hub domains during the summer of 2022. This article showed that medical literature represents a significant portion of downloads for the period, with approximately 22% related to medical journals. Six of the top ten most downloaded subjects were directly medical-related, with *The Lancet* being among the most frequently accessed journals. Furthermore, I identified the unique conditions which medical professionals face, that further drive Sci-Hub usage. This includes the time-sensitive nature of their work, massive publication volume, limited access despite open access progress, and critical information needs in low-resource countries. Using both this quantitative analysis of download patterns and a more qualitative examination of user testimonials found on Sci-Hub, the article highlights how medical professionals rely on Sci-Hub to provide faster treatment, access wider literature, and deliver care in resource-limited settings. Moreover, I argue that despite progress in Open Access, Sci-Hub has become an essential infrastructural component for medical information access, serving as a liberatory and prefigurative avenue in democratizing access to medical literature. This article points towards the pragmatic use of shadow libraries and Black Open Access alternatives, which becomes clear when viewing how they have become embedded in medical professional practice.

6. End Discussion

Scholarly knowledge production and dissemination today operates within a paradoxical framework: while digital technologies have created unprecedented possibilities for open sharing, a small group of commercial publishers has simultaneously consolidated control over academic publishing. This oligopoly, as scholars have termed it, commands the majority of the publishing landscape creating systemic tensions that reverberate throughout academia (Larivière et al., 2015; Shu and Larivière, 2024). Within this constrained landscape, researchers face intensifying pressures to publish prolifically, often at the expense of quality and meaningful contribution (Parchomovsky, 2000; Lee, 2014). Meanwhile, institutions confront what has been called the "Must Stock" dilemma—forced to accept bundled subscriptions and transformative agreements that allow publishers to extract revenue through both traditional paywalls and Open Access channels (Schmal, 2024). This fundamental contradiction, between the expansive potential of digital knowledge sharing and the restrictive practices of commercial publishing, creates the conditions for alternative systems to emerge. As this dissertation has explored, these alternatives have developed not merely in opposition to the established order, but through interactions with it, raising questions about access, legitimacy, and scholarly communication.

This dissertation began with three questions aimed at dissecting and understanding parts of Black Open Access, shadow libraries, and text piracy. Through analysis of these interconnected phenomena, this dissertation shows how informal academic knowledge distribution has evolved into a parallel system that both challenges and complements traditional scholarly publishing. I aimed at illustrating how Black Open Access as a distinct pirate phenomenon has developed beyond just piracy and transformed into an apparatus with its own economic logic and social practices. The first research question: how do informal and formal media economies intersect within Black Open Access, and how do these intersections shape both illicit and legitimate academic dissemination, points toward the intersection between formal and informal media economies in Black Open Access. These communities demonstrate what Bodó terms communality - where producers and consumers reunite in a non-industrial mode of cultural community, creating hybrid infrastructures that combine elements of both formal and informal economies (2014). This manifests in multiple ways, for example when shadow libraries become embedded within legitimate academic workflows, or link through legitimate websites such as Wikipedia or Facebook. This observation is confirmed in several of this dissertation's articles. In article IV: Patterns of Piracy: Sci-Hub

and Sweden 2011-2018, the analysis shows how Swedish Sci-Hub downloads mirror what can be understood as standard working hours, as well as being used to a higher degree in traditional academic contexts, i.e. concentrated in university towns. In article III: “*Why does pirating papers feel so good*”, there’s indication that users of shadow libraries, and the shadow library administrators themselves, make use of social media sites – such as Reddit – as an intermediary to discuss and market shadow libraries. Furthermore, this tendency is confirmed in article II: *Decentralized Digital Preservation: The LOCKSS Initiative and Shadow Libraries*, which shows how large platforms act as anchor points or intermediaries between shadow library sites. This integration extends beyond mere usage patterns to include the adaptation and mirroring of formal academic infrastructure, from professional interface design to preservation methodologies, which is shown in article I: *Gamifying Piracy: Functions and Users of the Z-library*.

The second question is: what mechanisms enable the creation and sustainability of Black Open Access communities, and how do users navigate shadow libraries to meet their textual needs? This question addresses the sustainability of Black Open Access communities, aiming to reveal how simple file-sharing systems have evolved into sophisticated technical and social mechanisms. Black Open Access communities have developed mechanisms to manage their resources. In article II, the analysis shows how distributed preservation strategies, what I have dubbed as “Pirate LOCKSS”, allow for continued existence and security through multiple domain copies. Just as the lines between formality and informality is blurred through the strategic use of established internet infrastructure, the same network and connections become important in questions of sustainability. The professional platform design, and tiered user engagement systems on shadow library site Z-library, encourages participation and community building. Beyond these aspects, increased user-engagement further diminishes the risks involved in collection management – allowing administrators to focus attention on obscuring the platform from legislative consequences. In addition, these factors prompt users to navigate these systems through a sophisticated infrastructure of community support, technical knowledge sharing, and adaptive survival strategies. In article III of the dissertation, sharing, support and survival is shown to be an integral part in discussions of the Black Open Access community. It is apparent that these questions are of great importance, and that these factors are essential for users to facilitate their text needs.

The final question is: How do users construct and articulate justifications for their engagement with shadow libraries and Black Open Access activities? This question is focused on user justifications, building on previous research on digital piracy, and focusing on how users construct moral and ideological frameworks that operate at multiple levels. These frameworks combine moral arguments about knowledge democratization and academic freedom with practical justifications based on institutional constraints and professional necessities. The dissertation's third article bears some of the answer to the third and final question in its title: "Why does pirating textbooks feel so good?". What the title reveals is the outlines of the moral justificatory framework in which some users of shadow libraries situate themselves in. For them, academic text piracy is a moral imperative, their moral argumentation is built on ideas of knowledge democratization, arguments of social benefit, and opposition to the commercial publishing models. These, as seen, are argued in various different ways, but seem to make out the core of the justifications for use based on moral and ideological standings. Beyond these, there are more practical justifications, which come to light implicitly in a few of the dissertation's articles. As mentioned, there are indications that Swedish users downloaded from Sci-Hub intensively during conventional office hours. Considering this with the fact that researchers in Sweden used Sci-Hub as an option during the negotiations between BIBSAM and Elsevier in 2018, shows that it may be a naturalized and practically justified option in professional settings. In the first article, I identified the tendency in the book reviews section of Z-library, where a user thanks the platform for making accessible texts which were made unavailable due to the Covid-19 pandemic. It can also be argued that the esthetic design choices on Z-library could act as a measure of legitimate professionalization of shadow libraries, which in turn would lend itself as a starting point for the community-based legitimization found in the discussion on Reddit communities. The dissertation shows how these justifications are not merely post-hoc rationalizations but are actively constructed and maintained through community interaction, technical expertise sharing, and quality control mechanisms.

The interplay between these three aspects - economic intersections, sustainability mechanisms, and user justifications - creates a self-reinforcing system that demonstrates how shadow libraries have evolved beyond simple piracy platforms. Particularly significant is how Black Open Access communities, have developed what previous research calls voluntary IP regimes that exist outside formal copyright frameworks (Bodó. 2014). An example of this is found in article I, with the possibility for authors and publishers to subject a text found on the

website to a copyright complaint, which, presumably, would result in a takedown. This approach to intellectual property suggests that informal media economies can develop nuanced approaches that balance Open Access principles with sustainability concerns.

The findings in this dissertation, further challenges conventional understandings of informal media economies in several important ways. Rather than operating in opposition to the formal economy, shadow libraries have developed into hybrid infrastructures that operate alongside and often in cooperation with legitimate academic channels. Their sustainability relies not just on technical robustness but on complex social and community structures that enable both preservation and evolution of these resources. Furthermore, the justifications for participation extend beyond simple economic necessity to encompass broader questions of academic freedom, knowledge equity, and institutional policy. To go deeper into these dynamics, it is essential to understand how shadow libraries intersect with the informal media economy and regimes of justification. Shadow libraries operate in what could be considered a regulated informality, where informal practices are governed by community-developed norms and restrictions rather than formal legal frameworks. This manifests through multiple channels, such as the high cost of academic texts and restrictive access policies of traditional academic publishers create barriers that shadow libraries address through alternative means of access, aligning with the informal media economy's role in facilitating the circulation of knowledge. It is also apparent when considering how the global nature of shadow libraries mirrors the transnational character of the informal media economy, fostered through digital platforms that provide spaces for users to share, discuss, and distribute academic materials – such as Reddit. From the perspective of regimes of justification, shadow libraries represent a response to perceived injustices in the formal academic publishing economy, with users appealing to higher moral principles such as knowledge democratization and the freedom of information. This theoretical framing helps explain how shadow libraries can become incubators for innovation within the academic realm. By providing platforms for the free exchange of ideas and knowledge, these communities may foster academic collaboration and intellectual growth in ways that align with the informal media economy's role in shaping formal media economy. This can for example be seen in the previous research, where Sci-Hub has been attributed to affecting citation on papers (Correa et al., 2022).

Unlike other media formats, the digitization of books has enabled entirely new possibilities for informal circulation in academic knowledge distribution. While book piracy has a long

history - from 18th century pirate publishers in Neuchatel to Soviet samizdat culture - the digital transformation of academic literature has spawned unique self-regulatory mechanisms within informal platforms. This distinctiveness becomes particularly apparent when examining what Jonas Andersson Schwarz describes as the "pirate ethic" - a fluid set of values that assess the rules of engagement within these communities (Schwarz, 2015). Drawing from Wolfgang Ernst's work, Schwarz's discussion of the archival dimension of pirate culture becomes especially relevant for understanding how shadow libraries operate. The archival imperative manifests in the work put into collection maintenance and preservation, similar to but distinct from traditional BitTorrent communities. This archival focus leads to an interesting tension: shadow libraries often reproduce conventional academic norms even while operating in opposition to traditional publishing systems. This reproduction isn't necessarily negative but rather reflects the context within which these libraries exist and against which they struggle. This process of legitimization becomes particularly apparent in platforms like Z-library, which maintains DMCA takedown procedures and detailed terms of service, creating a quasi-legal framework within an illicit space. Other platforms, like Annas-Archive, take a more radical approach, explicitly acknowledging their illegal status while justifying it through a broader mission of preserving human knowledge. As they state, "We can do things that other institutions are not allowed to do," positioning themselves as essential actors in the long-term preservation of textual knowledge (Anna, 2024).

This tension between opposition and legitimacy reveals a crucial aspect of how Black Open Access communities operate within the informal media economy. The sustainability of these informal academic economies depends heavily on what Bodó identifies as the 'collective identity' of the community (Bodó, 2014). In the context of shadow libraries, this can be seen manifested in the shared justification frameworks that balance moral imperatives with practical necessities, and the community support structures that facilitate knowledge sharing and preservation seen in article three. It can also be found in the technical expertise networks that ensure platform stability and accessibility, such as the open dialogue between platform and users on Z-library blog found in article I. But also beyond this dissertation's articles, in shadow libraries such as Annas-Archive - which have rigorous quality control mechanisms that mirror academic standards. This reproduction of academic publishing world's normativity in shadow libraries presents both challenges and opportunities. As these platforms become normalized as just another avenue for information collection, they risk reproducing problematic aspects of the publishing world, such as reaffirming hierarchies of knowledge

production and journal prestige. However, research has shown potential positive effects, such as increased visibility for researchers from Global South institutions (Singh et al., 2021).

Particularly significant is how institutional decisions directly influence informal media economy behaviors, creating complex feedback loops between the formal and informal economy. The BIBSAM consortium's cancellation of their Elsevier agreement in 2018, for instance, led to measurable increases in shadow library usage among Swedish researchers. This illustrates how formal institutional actions can inadvertently strengthen informal knowledge distribution networks, while simultaneously highlighting the deep interdependence between these systems. The technical and social infrastructure supporting these practices reveals sophisticated mechanisms of sustainability and adaptation. Shadow libraries have developed what might be termed an "infrastructural inversion" in academic information access, where things such as professional interface design mimics legitimate digital libraries, formal preservation methodologies are adapted into "Pirate LOCKSS" systems, or how established platforms (such as Wikipedia, Reddit, Twitter) serve as stable intermediaries. This hybrid infrastructure demonstrates how shadow library use is motivated through what can be understood as a parallel academic infrastructure - neither fully formal nor completely informal, but rather something in-between.

This sort of boundary state can be seen in what article I identifies as three classifications of users, we have the basic users who primarily download resources, the intermediate users who occasionally engage with platform feature, and those that actively maintain and expand collections – so-called prolific users. These user categories correspond to different levels of engagement in Black Open Access legitimization frameworks, from simple necessity-based practical justifications to moral and ideological positioning regarding academic freedom and knowledge equity. This stratification aligns with the concept of pirate ethics, where community members develop differentiated roles and responsibilities within the informal media economy (Andersson Schwarz, 2015). As mentioned, these communities have developed networks that both mirror and challenge traditional academic gatekeeping. This can, for example, be seen in discussions on shadow library subreddits, which blamed TikTok for the shutdown of Z-library. Shadow libraries should be understood as more than just a response to access barriers - they constitute a new form of knowledge infrastructure that both challenges and complements traditional academic publishing. This hybrid system has developed its own norms, technical standards, and social practices while maintaining crucial

connections to traditional academic infrastructure. The sustainability of these systems relies on what could be termed a distributed resilience - a combination of technical robustness and social cohesion that enables both preservation and evolution, i.e Pirate LOCKSS. An expanded view of this term, beyond that which is defined in the dissertation's second article, includes social infrastructure components that encompass community-based quality control, technical knowledge sharing, user verification systems, and collaborative troubleshooting networks. Additionally, it incorporates legitimization frameworks through professional platform presentation, quasi-legal structures, community governance mechanisms, and ethical justification systems that collectively establish credibility and operational integrity. This multi-layered infrastructure makes the Black Open Access community a sort of self-reinforcing system of communality where the boundary between producer and consumer is inherently fluid. This fluidity enables shadow libraries to adapt and evolve in response to both external pressures and internal needs. Particularly significant is how the Black Open Access communities navigate what might be termed a paradox of legitimacy manifested in the tension between operating outside formal legal frameworks while simultaneously adopting and adapting formal academic practices. A paradox which is defined based on how informal media economies, such as shadow libraries, adapt from their formal counterparts in aspects such as design, structured metadata systems, ethical frameworks for sharing, etc.

This dissertation examines how Black Open Access functions as a pirate-driven solution to academic publishing inequities. Through an investigation of shadow libraries and text piracy practices, I have shown how alternative distribution systems operate and have evolved within the contested terrain of intellectual property rights and knowledge accessibility. Central to this investigation are the platforms, websites, and communities dedicated to circumventing traditional publishing through piracy: shadow libraries. These range from established archives like Sci-Hub and Library Genesis to smaller, community-specific repositories that serve niche disciplines. The dissertation maps both the technical infrastructure that enables these shadow libraries and the social networks that sustain them, highlighting how technical innovation intersects with activist ideologies. By employing a mixed-methods approach combining netnography, platform analysis, and computational tools this dissertation shows the complex motivations driving participation in Black Open Access networks. The dissertation's findings show how these initiatives emerge in the fault lines of an acknowledged broken system. Rather than dismissing shadow libraries as mere copyright infringement, the dissertation frames them as a response to structural failures in academic publishing, demonstrating how

such responses can produce sustainable models for preserving and circulating digital text media while challenging conventional assumptions about ownership, access, and the commons in scholarly communication. This includes viewing shadow libraries as parallel systems which challenge traditional understandings of informal media economies. Rather than representing simple opposition to formal systems, these communities have developed into a complementary factor, operating alongside and often in cooperation with legitimate academic channels while maintaining their distinctive characteristics. This dissertation began by examining three key questions about Black Open Access. What I first sought to do, dissecting and understanding, developed into a large web which hints towards a complex ecosystem that transcends simple categorizations. In descriptions of the informal economy, and in extension the informal media economy, there's a singular factor which, for lack of better words, cannot be excluded: fiscal circulation. Piracy, on the other hand, is often plagued with the same disease, the focus on the circulation of goods for the purpose of monetary exchange. Now, money may make the world go round, but in DAD's indie adage – "it often makes it flat". And it is here the starting point of piracy begins. Literary scholar and open access advocate Martin Eve's excursions into the infrastructure and aesthetic components that drive pirate culture shows that the main motivation for the duplication and circulation of pirate copied media, be it video games, software, or books, often comes from a very different source of motivation (Eve, 2021). Take TV shows for example, this aspect of the pirate industry can, for better or worse, be an informal copy of its formal twin (the film industry) wherein the modus operandi is the circulation of productions amidst the ever-reaching grasp of commercials. Whereas in the formal sector the commercials may be more subtle, both as expression and content (think product placement), in comparison with the informal sector in which the ad spaces on torrent sites or pirate streaming platforms more often than not involve a series of popups and offensive banners displaying the more questionable aspects of internet advertisement (think pornography and gambling). This, by no means, is representative of ALL TV piracy, but gives an indication of a fiscal aspect which Lobato and Thomas carefully manage to describe. Alas, this aspect lends some flatness to the world, and especially to those pirates described in Eve's work. More importantly, for this dissertation, it misses those who pirate media on the basis of ideology. Ideology is by no means reserved to the pirates that get no financial gain from the production and dissemination of their work, they too are often vocal ideologues condemning the rigid nature of modern copyright. Nonetheless, they represent a segment often treated as hypocritical due to their reliance on ad space to generate

the income needed to perform their work, both within and outside their respective communities. Shadow libraries, almost exclusively (exceptions to the case can be found in article two), operate according to a different standard. Within these communities, advertisement is akin to social suicide. Shadow libraries are products of opposition which can be seen in their common call to action where they specifically cite publisher profit margins as an anathema to the good of information circulation, committing to the same practices would thus be hypocritical to the point of seeking antagonism (Barok et al., 2015). Their informality is expressed on multiple levels. Not just as the flipside of the conventional system of publishing – even though much of their existence is hinged upon it. This is a particular aspect that Lobato and Thomas rightly point to, that is of note in terms of the informal media economy. The opposing aspect happens to be a compelling addition to the understanding of informal media practices as well, namely, the upheaval of and informalization of traditional economic exchange.

This points back to a point which I find important to continuously hammer in: that the intersection of formal and informal media economies creates feedback loops that influence both systems. The sustainability mechanisms combine technical sophistication with social cohesion in ways that enable both preservation and evolution. Additionally, this is underbuilt by the user justifications, which operate at multiple levels, from practical necessity to ideological commitment, creating frameworks that sustain both technical infrastructure and community engagement. The articles demonstrate in various ways how shadow libraries have evolved beyond simple piracy platforms to become communities of academic knowledge distribution on the border between formal and informal, supported by multiple layers of technical, social, and moral infrastructure. This evolution suggests a future where formal and informal economies will continue to co-evolve, each influencing and shaping the other's development. Understanding these dynamics is essential for comprehending the future development of scholarly communication and the evolving relationship between formal and informal media distribution economies.

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