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Saarti, Jarmo; Tuominen, Kimmo
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From interlending to resource sharing between scholars? – An analysis of recent developments

Jarmo Saarti

University of Eastern Finland Library, Kuopio, Finland.

E-mail address: Jarmo.Saarti@uef.fi

Kimmo Tuominen

Helsinki University Library, Helsinki, Finland

E-mail address: Kimmo.K.Tuominen@helsinki.fi



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Abstract:

Even though resource sharing between scholars is evolving rapidly, we still have paper-based interlibrary lending (ILL) procedures in use. However, the current business model of acquiring toll-access journals and e-books does not seem to fit very well with traditional ILL practices. In addition, the new models of peer-to-peer resource sharing between academics seem to be much more effective than ILL. Scholars arrange access to the needed publications by using legal (buying, exchanging) and illegal means (Sci-Hub, etc.) for accessing the publications they need. Furthermore, the demands for open access (OA) have increased, voiced not only by librarians and science funders but also by politicians. This development might change the scholarly publication ecosystem, even though older publications are still likely to remain closed. In the present paper, we contrast the ILL and usage statistics of Finnish university libraries with the use of ResearchGate, a popular academic social network, which we treat as an example of a peer-to-peer sharing service. Based on the data, we attempt to understand how resource sharing, on the one hand formally between institutions, and on the other hand informally between scholars, will develop in the digital and increasingly open future.

Keywords: university libraries, researchers, resource sharing, interlibrary lending, academic social networks, open access, ResearchGate, Finland.

1. Introduction

The operational environment of traditional ILL activities began to evolve rapidly during the 1990's. Due to the spreading of internet technologies and network-based services, scholarly communication tools changed and we moved from print journals to e-journals. From the beginning of this millennium, we have witnessed the transformation of monographs from physical documents to e-books. Recently, we have also seen a rise of different types of digital services for academic communities to share their ideas and published results (Muhonen & Saarti 2016) as well as emergence of MOOCs and other kinds of digital learning environments.

Advancements in technologies and social practices have led to a paradigm change in scholarly publishing. The printed era provided a quite closed environment where library premises and different types of collections of physical entities were of utmost importance in enabling research activities. Digital technologies revolutionised these paper-based processes. In principle, it is nowadays possible to publish, disseminate and discuss research results in real time and without gatekeepers.

We have previously characterised the ongoing change as a move from the printed world via digital to the post-digital operating environment of science (Saarti & Tuominen 2017). The recent policy discussion and policy initiatives around open science have speeded up this process. Policy makers and research funders have started to emphasize the need for opening the whole research process and making the publicly funded results of the academic work openly available (see European Commission 2012). The goal of these pursuits is to increase the societal and scientific impact of the scholarly activities.

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The changing nature of the operating environment of scholars has also affected our conceptions of ILL practices. We have had to broaden the paper-based era's views. *Resource sharing* means much more than lending and sending paper copies or faxes between libraries. Resource sharing includes all the types of activities that try to ensure, within the academic and academic library community, the access to all the information resources needed in scholarly work.

The changes are so vast that they have also transformed the role of academic libraries, which no more have a monopoly for providing access to digital materials. The digitalization of scholarly publications means, among other things, outsourcing some of the traditional library functions to commercial actors. Furthermore, the rise of social media makes it easier for researchers to distribute and share publications and other documents. It is now wonder why the question of *who is actually in charge of providing information resources for the academia* pops up every now and then. There seems to be a need for reframing the collection policies in the academic library community and, especially, reflect upon how to make these policies more effective, coherent and up-to-date (Baraggioli 2018, Bjørnshauge 1999, Vattulainen 2018).

Another thread of the conversation is the role of the research libraries in ILL or in resource sharing activities more generally. At the turn of the millennium, the consensus seemed to be that libraries are and will be the primary actors in ILL. Some library professionals even predicted that the amount of ILL would be growing in the future. Many of us expected that new digital services would help to manage the ILL processes (Connolly 1999). At the same

time, some authors saw that the digital operating environment is not without pitfalls. The use of digital tools might lead to new kind of problems or obstacles, for example, within the realm of copyright law, and that is why libraries should perhaps specialise only in the so-called hard-core ILL, i.e., in the distribution of the printed, less-used materials among institutions (cf. Prowse 2000). The discussion on the role of academic libraries as nodes in the evolving post-digital resource sharing environment and the role of the so-called end users still continues (Saarti 2018).

In the present paper, we concentrate on analysing the changes that have taken place in Finland because we know the Finnish library system and the infrastructural and political context of academic work and library activities in our native country (Tuominen & Saarti 2012). However, we suppose that our remarks are not specific to the Finnish situation but reflect the general changes of scholarly practices and research environments. In essence, we ask how have the Finnish resource sharing landscape and ILL practices changed in the past few decades. We utilise the Finnish Research library statistics database and analyse ResearchGate (<https://www.researchgate.net/>) as an example of the kinds of resource sharing tools that Finnish researchers use in disseminating their research and for generating more visibility to it. To complement our views, we utilise the statistics generated by the Finnish National Exchange Centre of Scientific Literature.

2. Changes in ILL and document exchange activities in Finland

The Finnish Research library statistics database (<https://yhteistilasto.lib.helsinki.fi/?lang=en>) gives a comprehensive picture of the Finnish academic libraries. The libraries collect the data annually according to the international library statistics standards and the online version of the database offers statistics from the year 2002.

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Figure 1. shows the development of ILL in all Finnish universities. A rapid decrease is evident both in national and international ILL. The biggest change has happened in national ILL activities. It seems that the amount of traditional ILL is diminishing although ILL seems still to be important for some research purposes.

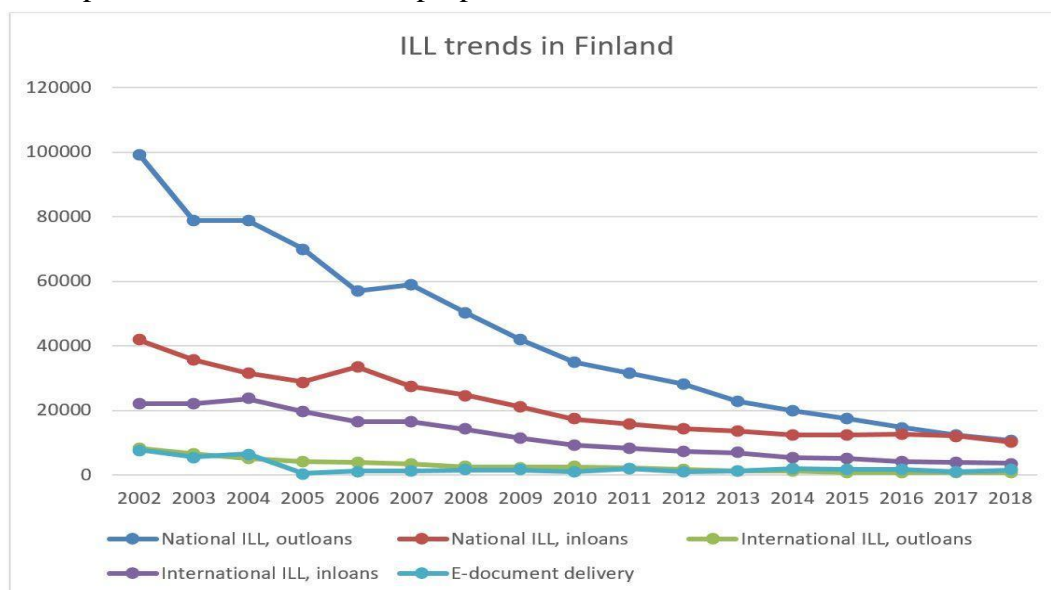


Figure 1. ILL trends in Finland 2002 – 2018.

Figure 2. shows the most central reason to the decreasing of ILL in Finland. The use of digital resources has been growing dramatically during the last two decades. Especially, e-book revolution seems to have taken place in the Finnish universities. Researchers and students use nowadays more e-books than e-journals.

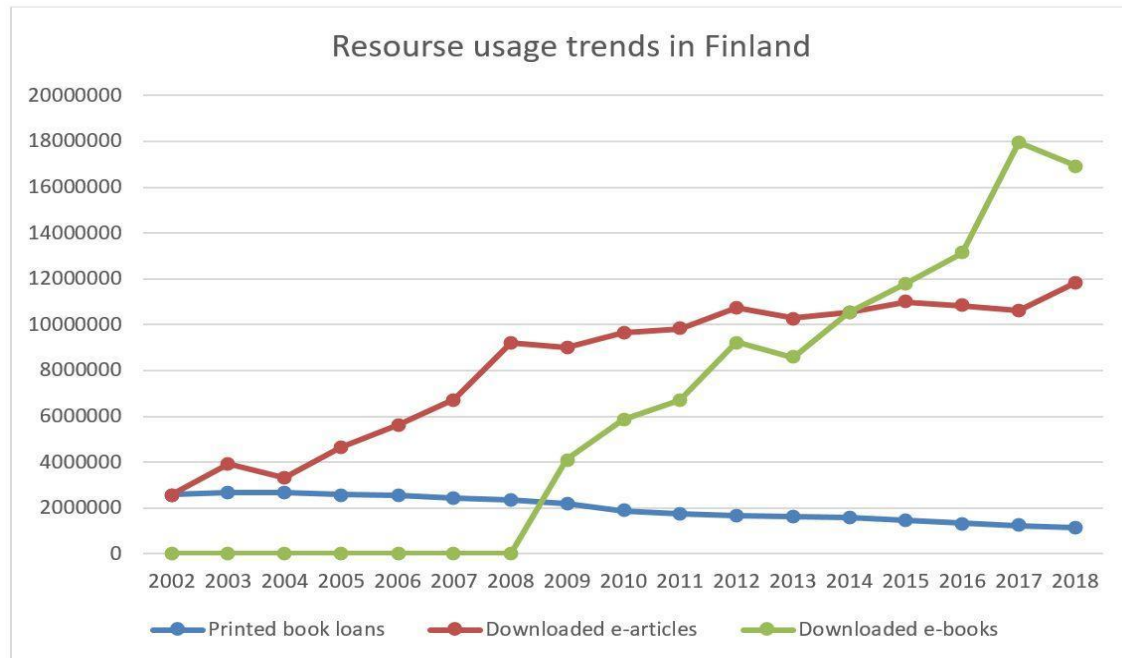


Figure 2. Trends in the digital and printed resource usage in Finland 2002 – 2018.

When comparing the usage of e-books with the traditional printed book loans, one should note, however, that renewals are not included in the numbers of traditional loans. In addition, the usage numbers of digital materials do not take in the account how many times the same person has downloaded the same e-book, i.e. there is no distinction between the first use and the re-use in the download numbers of digital materials. Another unfortunate fact is that we do not have national statistics of e-book usage before 2009. However, it is clear that the number of the first loans in printed collections has fallen at the same time as the usage of e-books has increased.

One reason for the extensive use of digital resources in Finnish libraries is the FinELib consortium, which has been so far able to help Finnish universities in making the big deals and acquiring toll-access journals. Larger universities, of course, buy many e-resources outside the consortia, too. University libraries have made e-books and e-journals more familiar to users through different kinds of digital services, marketing efforts and information literacy education. Most of the users nowadays prefer digital media, even though there might still be some academics who love the exquisite scent of dusty papers.

Finland has a national Exchange Centre of Scientific Literature (ECSL, <https://www.tsv.fi/en/services/exchange-centre-scientific-literature>), which belongs to the Federation of Finnish Learned Societies. The Centre sends the new publications of the Finnish publishing bodies immediately to its exchange partners. When ECSL receives publications from the partners, it forwards them free of charge to the academic libraries that

have ordered them from the Centre. Most of the publications are serials, but ECSL exchanges research monographs and monograph series, too.

The authors asked and received statistics concerning the trends in the development of Finnish scientific literature exchange. The trend seems to be similar than with ILL in Finland. When the centre started its activity, it had almost 6000 international and national exchange points. The number of these points has been diminishing all the time and 2012 was the first year that the number was below 3000. In 2018, the number of these points went below 2000 and the number seems to fall yearly at the rate of -5 %. When the Centre had 13270 arriving serial publications in 1989, this number has currently decreased to 4057. Because of the historical changes of the Centre and its customer base, these numbers show the direction but are not as exact as the data we have of the trends in the Finnish ILL.

The organized exchange of publications is an old and traditional form of scientific communication. Digitalization has affected this practice but it has not completely disrupted it in Finland. There still seems to be researchers, research areas and libraries that benefit from scientific literature exchange, even though there are fewer and fewer of them. It is interesting to see what will happen to publication exchange if most of the new scholarly papers are going to be available not just digitally, but also in OA.

3. The Finnish researchers and peer-to-peer resource sharing

The digitalization of the research environment has made it possible to build social media services for researchers and to use general social media (Facebook, LinkedIn, Twitter, etc.) for research-related purposes. Many social media sites facilitate the peer-to-peer sharing of publications and other documents. *Academic social networks*, like ResearchGate and *Academia.edu*, aim their services specifically for researchers. They enable networking and document sharing, within and across institutional and national boundaries. Some of them are quite loose with copyright, even though they are not breaking the law as clearly as Sci-Hub, which is a digital “library” of pirated publications.

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On the right side of the law are those pure OA journals and mega journals that often base their business models on Gold OA and article processing charges (predatory publications might be exceptions in this respect). In addition, preprint servers like *arXiv* as well as the emergence of institutional repositories (and Green OA) also contribute to the fall of ILL numbers. *Google Scholar* is the most used tool for researchers (van Noorden 2014) and its search results often contain publications originating from discipline-based and institutional repositories. Services like *Unpaywall* and *Open Access button* are becoming mainstream too.

Perhaps in a 100% OA world, ILL for *new* scholarly publications would no more exist. It is, of course, debatable, when and how this kind of complete flip-over is going to happen or if it is going to take place at all.

The consequence of these developments is that the need for ILL decreases. Unfortunately, we do not have reliable statistics of the informal peer-to-peer resource sharing. Researchers have circulated scientific documents via email and file sharing servers as long as the internet has existed, but academic social networks enable resource sharing in a much larger scale and more effectively and easily than has previously been possible. The most popular academic social network is ResearchGate (van Noorden 2014). It has especially gained users from

medicine, physical sciences, life sciences, and engineering (Thelwall & Kousha 2016), but also researchers in many other domains are using it widely. As an academic social network, ResearchGate has other functions besides document sharing. These functions include asking and answering questions, browsing for new publications and finding collaborators and job announcements. However, resource sharing and increasing the visibility of one's own work seem to be the leading motives for using ResearchGate.

Table 1. depicts the status of the ResearchGate use in Finland. It includes the number of the ResearchGate users at each Finnish university, the number of their publications and the number of the weekly reads of them.

	<i>Users</i>	<i>Publications</i>	<i>Publication reads (week 25)</i>
Aalto University	6257	1553	47520
University of Helsinki	10180	57398	71401
UEF	4012	5099	22253
University of Jyväskylä	3899	3821	27206
University of Lapland	798	239	1989
LUT	1942	1604	17356
University of Oulu	4182	15855	29145
Hanken	679	89	4149
University of the Arts	146	9	281
Tampere University	5473	16243	33899
University of Turku	5308	19139	28447
University of Vaasa	958	331	5263
Åbo Akademi	2005	4686	9823
Total	45839	126066	298732

Table 1. ResearchGate use at the Finnish universities (data collected in June 2019).

We have collected the data for Table 1 from the institutional statistics pages of the Finnish universities at ResearchGate. People might express their institutional affiliations in many different ways. However, we do not take account of these potential variations in the present paper, i.e. we use only data based on the official name of each university and on how the ResearchGate users describe themselves. Thus, the data might be somewhat unreliable (although ResearchGate checks the authenticity of institutional e-mail addresses).

Table 1. shows that the largest and most research-intensive Finnish universities have the most active user population in ResearchGate, i.e. the number of users and publications positively correlates to the general size of the university. Finnish researchers seem to be using ResearchGate widely for increasing the visibility and accessibility of their publications and for finding potential collaborators.

Even though most of the users are whole-time researchers, the users might also hold other positions as librarians, students or administrative personnel in their respective universities. We do not know how many of the publications are available as full texts but preliminary scanning shows that at least researchers with high *RG scores* (the visibility metric used by

ResearchGate) seem to add full texts to ResearchGate regularly. If full text is not included, ResearchGate offers a possibility to request a copy of the publication directly from its author.

The researchers in Finnish universities annually publish about 38000 scholarly articles (<https://vipunen.fi/en-gb/university/Pages/Julkaisut.aspx>). Even though it is hard to estimate the coverage of Finnish publications on ResearchGate based on these numbers, it is safe to say that substantial number of papers is available in ResearchGate, and through it, one can easily request more papers from the authors. ResearchGate is currently a much larger distributor of Finnish scientific publications than the ILL system of Finnish University Libraries as a whole, and ResearchGate might even contain some publications that would be difficult to get via traditional ILL means.

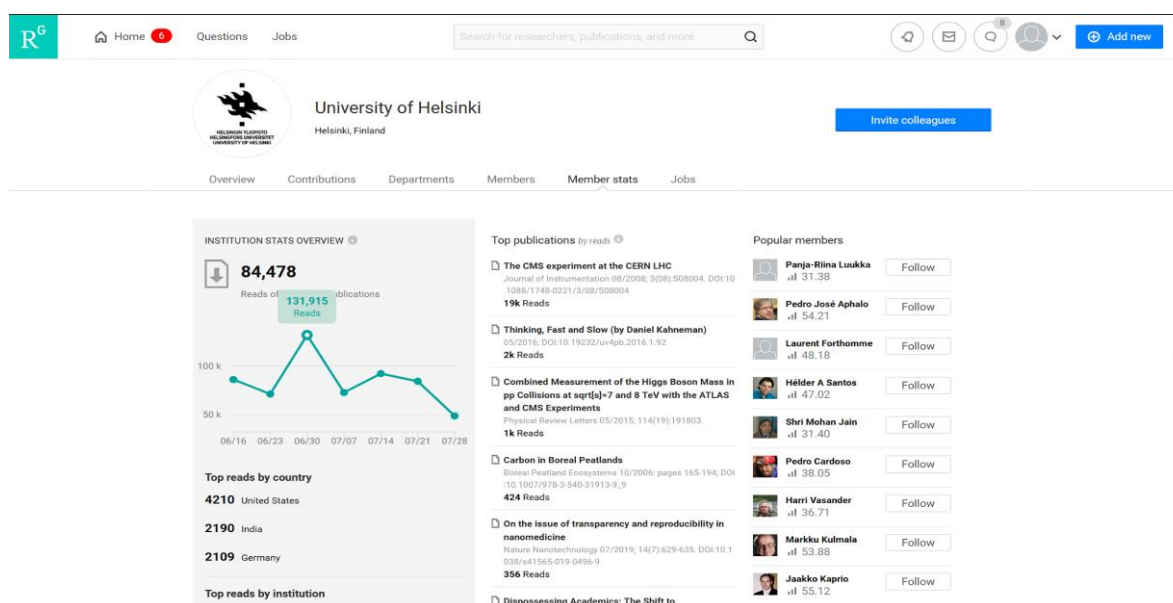


Figure 3. The University of Helsinki institutional page of the member statistics (https://www.researchgate.net/institution/University_of_Helsinki) in July 26, 2019.

ResearchGate collects the number of reads, the top reads by country and by institution weekly. The second top publication of the week 31 is a one-page book review of a popular-scientific book published in *UV4 Plants Bulletin*.

Even though some researchers might assume that the papers available in ResearchGate are OA, this is not the case because ResearchGate requires authentication and breaches copyrights in many cases (cf. Piwovar & al. 2018). To use ResearchGate, one has to reveal one's identity (or invent a fake one). As we know, the activities, contacts and interests of online identities are the real currency of the Internet Age. In this sense, the social media offers no free lunches to us.

One might wonder how permanently ResearchGate stores full texts. Can we be sure that all the imported files will be available in the future? We do not know how the business model of ResearchGate will evolve and if the whole service even ceases to exist one day. One possible scenario might be that, as has happened with Mendeley, one of the big publishers acquires ResearchGate. Furthermore, it is possible that ResearchGate will not always be as open as it is today. Academia.edu – one the main competitors of ResearchGate – has decided to offer

much more services to those users who are willing to upgrade their membership status and to pay for it.

Legal problems might hinder the use of ResearchGate in the future and endanger the permanent availability of all the documents it contains. Seventeen publishers – including Elsevier, Wiley, BMJ and ACS – formed the Coalition of Responsible Sharing in October 2017 to “address the copyright infringing practices of the ResearchGate site.” The coalition is aiming for “a solution that is in the interest of all stakeholders – ResearchGate, publishers and researchers – and consistent with access and usage rights.” As no one has yet found this solution, the Coalition has forced ResearchGate to remove 1.4 million articles from its site. Nevertheless, the Coalition still sees that ResearchGate contains millions of copyrighted articles “in contravention of agreements between publishers and authors” and that the service is “taking no responsibility for this illicit activity.” (Coalition for Responsible Sharing 2019.)

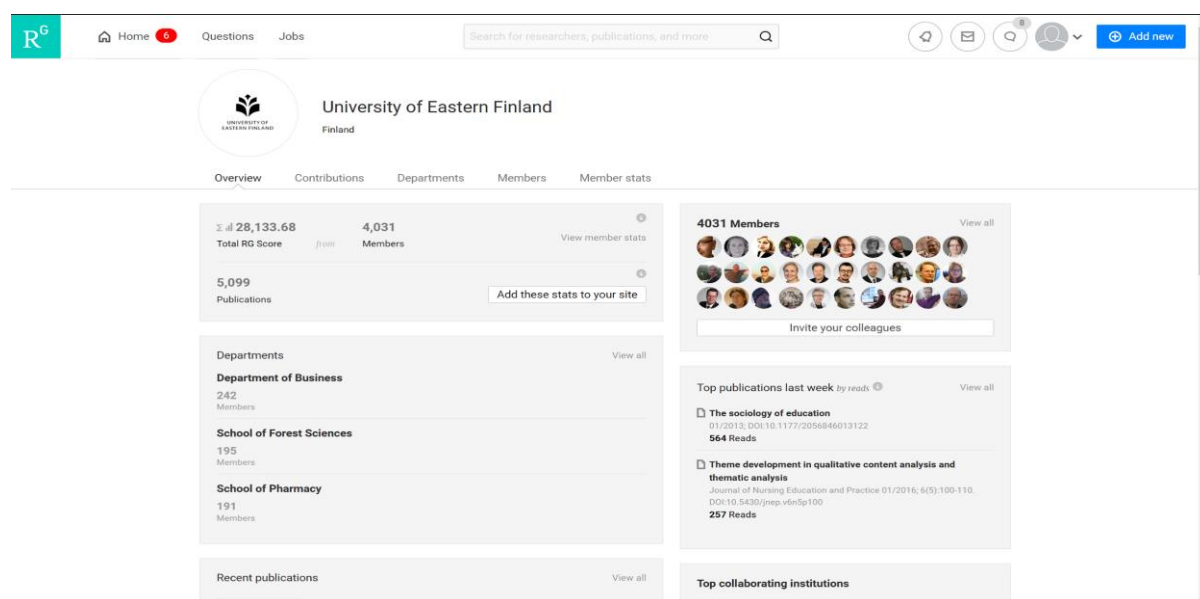


Figure 4: The institutional page of the University of Eastern Finland (https://www.researchgate.net/institution/University_of_Joensuu) in July 26, 2019.

4. Conclusions

The analysed data shows the falling of ILL and printed loans as well as the rise of the usage of e-books and e-journals. It seems that ILL has transformed in Finland into a complementary, niche market service. The scholars rely on ILL mostly when they have special needs for printed and rare documents. This kind of a detective work for finding exotic, old or peripheral publications seems to be the current and future role of ILL professionals.

Finnish researchers have adopted academic social networks where they can disseminate publications and promote their expertise without institutional intermediaries. The reasons for the popularity of ResearchGate seem to be its' ease of use and the intuitive nature of the user interface. The researchers might be aware of the copyright problems with ResearchGate but they do not seem to care for them too much. Researchers are especially active in using the

networks in peer-to-peer resource sharing, which might be another factor decreasing ILL. Furthermore, if the 100 % flip over to OA happens, as some have prophesied, or if the amount of OA publications continues to grow as it has been growing (Laakso & Björk 2016, Piwowar et al 2018), ILL numbers might fall even faster than thus far.

Because of Plan S and country-based OA mandates, national consortia negotiations have become more difficult than they have been. It is probable that no-deal situations between consortia and big publishers are increasing. This might amplify ILL in the future. Anyhow, it is more likely that the researchers will use other legal or illegal means to get the information they need. ILL seems to be too slow for the researchers who are used to the immediate response from the services like Amazon and Google.

The described developments have consequences to academic libraries, their daily work and services as well as for the resource allocation within the libraries and their host universities. Recently, many Finnish academic libraries have faced funding cuts and devised various kinds of survival strategies. In some cases, the libraries have ceased to exist as separate organisations.

The rise of academic social networks as informal resource sharing tools generates new kinds of problems. Besides legal challenges with copyright and user privacy, academic social networks pose other strategic risks to universities. The business models and black-box algorithms of the networks might not align with the basic academic goals and values. The recent landscape analysis of the changes in academic publishing specifically warns that outsourcing certain key functions to private companies may upset the power balance and lead to a situation where the companies are able to influence too much the decisions of the universities. The risk is that the private sector gets too great a role in the analytical assessment of the universities and the performance of their staff and students. (SPARC 2019.)

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Document sharing, reading and the contact networks of researchers are the kinds of data that academic social networks generate and utilize. When this kind of big brother data gets into the hands of one of the central players in publishing and information analytics businesses, e.g. through company acquisitions and mergers, it might provide an enormous competitive value when combined with other kinds of data and indicators (SPARC 2019). This may lead into an unhealthy situation in which the publisher knows more about the university than the university itself. As the information professionals realise, it is a short route from knowledge to power.

Research librarians should be more aware of the development and current nature of academic social networks. We should be able to give our academics relevant information on the potential and possible problems of informal resource sharing.

Even though ILL is not able to compete with academic social networks, it might still be the last resort for our users. Is it not true that we should be able to offer our users a legal way to get the information they need?

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