

Who may swim in the ocean of knowledge?

# SciHub breaks the monopoly of scientific publishing

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**Since 2011, Russia-based Sci-Hub has accumulated 67 million journal articles. Available to all, free of charge. Elsevier and the other commercial publishers are loosing their ability to assert copyright over common knowledge and restrict access to information.**

The sum total of all scholarly and scientific works is a vast ocean of knowledge. To create new knowledge, all must swim in that ocean, building on the existing stock of wisdom. We all stand on the shoulders of the giants that came before us.

But in our modern world, much of that knowledge is held in the hands of a few large corporations, particularly the British-based company Reed Elsevier, which asserts absolute control over a large portion of scientific journal articles, extracting the efforts of scientists all over the world and then claiming absolute ownership over their work. This new-age East India Company had the astounding revenues of GBP 6.895 billion (Rs 62,000 crore) in 2016 and the even-more astounding profit margin of 39% for its scientific publishing arm.

The non-profit organisation Crossref estimates there are 94,841,081 scholarly works in existence, including journal articles and books. There are a total of 56,726 journals in existence, such as the Journal of the American Medical Association or the Indian Journal of Scientific Research. Much of that knowledge is locked behind expensive pay walls, with an individual paper often costing Rs 1,941 (US\$30) and institutional access for universities often running into millions of dollars per year. Even at those prices, access is subject to stringent limitations on use.

In 2011, a young graduate student in Kazakhstan named Alexandra Elbakyan grew frustrated with being unable to access the scholarly works she needed to pursue her studies and created a web site called Sci-Hub, based in Russia, which has now accumulated a trove of 67 million journal articles. Sci-Hub makes this information available to all at no charge.

## Response to Sci-Hub

Sci-Hub has proven to be wildly popular, particularly in schools and countries without access to the expensive subscription services available to those lucky enough to attend the fancy schools such as Harvard and Oxford. Over 200,000 papers are downloaded every day directly from the site, and many of those downloads are in turn shared widely among people in the same class or department. The largest group of users are in China, which downloaded 24,938,665 papers last year.

The second largest group of users of Sci-Hub are from India, which downloaded 13,143,462 papers last year. These are no random downloads, the students of India make systematic and regular use of Sci-Hub. Other countries in the top 10 include Brazil, Iran, Indonesia and Russia. Also in the top 10 are the US, France, and the UK, because students in those countries are evidently frustrated with

how difficult it is to access and use information from the antiquated and purposely limited systems provided by the vendors than from Sci-Hub.

Sci-Hub has not been taken well by these big and immensely rich organisations that claim an exclusive right over the scientific literature. They have gone after Elbakyan with the full fury of a howling mob of lawyers, obtaining multi-million dollar judgments against her in US courts and sweeping court injunctions ordering internet providers to make her disappear from the net.

These attacks have not worked. Elbakyan has gone into hiding in Russia, but Sci-Hub continues to grow and the downloads continue to flow. It is evidently hard to quench the thirst for knowledge.

The knee-jerk reaction of some is that this is simple piracy and must be stopped at all costs. But copyright is not an absolute right, it is a limited grant for a limited time. By extracting increasingly exorbitant rents over knowledge and by limiting what people can do with that information, the companies have overstepped their rights under the law, they have colonised knowledge for their own pecuniary gain.

An example of why copyright is not absolute is the Marrakesh Treaty, an international agreement signed by 79 countries that specifies that providing access to the blind is not subject to copyright limitations. India was the first country to ratify this seminal agreement in 2014. But how can the visually impaired get access to all those journal articles if they are buried behind a cash register?

Another international treaty, the Berne Convention for the Protection of Literary and Artistic Works, provides an exception from copyright for teaching purposes. That exception has been enshrined in Indian law in Section 52 of the Copyright Act of India, which states that copyright does not apply for materials used “in the course of instruction”. This flows directly from the right to education, which is deeply anchored in the fundamental rights of the Constitution of India.

### **Dire situation in less-well-endowed institutions**

It is clear that the severity of the limitations on use imposed by companies such as Reed Elsevier go far beyond the limited rights they possess. It is also clear that these companies often assert copyright over materials to which they do not have the rights. I was able to document this in great detail in some research I did last year.

In the US, we have an exclusion from copyright for what are called “works of the US government”, including scientific research by federal employees – such as doctors at the Centers for Disease Control or the National Institutes of Health – which is conducted in the course of their official duties. These works are in the public domain and are not subject to copyright.

A party not related to Sci-Hub obtained a copy of a significant portion of that database, and in turn provided me with a copy. I used that database to look for works authored by US federal employees, and found 1,264,429 journal articles. I then pulled a statistically valid random sample of 10,000 articles distributed across 30 of the top publishers and found that in the vast majority of the cases, the publishers were improperly asserting copyright over material that belongs to the public domain.

Another example of invalid copyright claims by publishers is a study conducted by University of Pennsylvania researchers. In the US, prior to 1964, copyright registration required period renewals to remain valid. Their research has shown that most periodicals (including journals) failed to meet those renewal requirements and the material thus passed into the public domain. Nevertheless, the publishers continue to assert copyright over these materials.

The spiralling prices for access to the scientific corpus means even the richest schools are beginning

to pull back. Institutional access often costs Rs 32.3 crore to Rs 129.4 crore (\$500,000 to \$2 million) per year. In 2012, even Harvard – the richest university in the world – announced it was cutting back on access to the scientific literature because of the costs. In Germany, the University of Konstanz dropped all access to Reed Elsevier journals, citing a 30% increase in cost in just a few years.

If the richest universities can't afford the prices, you can imagine how the situation is much more dire in those institutions less well endowed. But students have a thirst for knowledge and are motivated to learn and better themselves, so they turn to any source they can find, as evidenced by the huge use of Sci-Hub in India.

The limits on use also impede the progress of science. Many vendors do not even allow organisations to index the scientific literature without paying the full price for access, so creating a bibliography of all articles in a given field is prohibitively expensive. The use of “big data” to examine large collections of articles and discover commonalities and trends is exceedingly difficult if not impossible.

### **Providing access to students in India**

In India, the principle that copyright does not apply for materials used in the course of instruction was recently affirmed by the Delhi high court in the [Delhi University copy shop case](#). The Rameshwari Photocopy Shop is located on the premises of Delhi University, and was selling students course packs with copies of journal articles. At the behest of three large publishers, the shop was raided by armed police and charged with high crimes for violating copyright. After an intervention by an association of students and an association of academics pointed to the “for the purposes of instruction” exception to the copyright, the court said no wrongs had been committed. The right to education triumphed over the baseless claims of the publishers.

Despite this principle of law, students in India are being forced to go to Sci-Hub in Russia to find the materials they need to educate themselves, and forcing them to do so is a wrong being committed against the students. Students should be able to access these materials with the full blessing and support of their institutions and professors instead of being forced to fend for themselves in the wilds of the Internet. I believe this situation should be changed.

The database I used to look for works of the US government contained 60,179,000 journal articles, which is about 89% of the contents of Sci-Hub. That database, which is housed on 16 disk drives, each with a capacity of eight terabytes, is now in India in a secure location.

**Let me be very clear about something:** this database will not be placed on the Internet for general-purpose access. This will not be used to create an India mirror of Sci-Hub. It has been carefully protected to prevent such an occurrence. It is in India for a specific and limited purpose.

The intent of this action is to understand if one could provide access to the materials need in the course of their instruction to the 20 million university students in India on a one-on-one basis, providing each with the specific materials assigned by their professors. I'm not even sure if using the disk drives now in India is the right way to go, and perhaps the database won't even be used. Perhaps a better answer is to form a consortium of libraries in Indian universities to scan paper copies in their collections. Perhaps there are other ways to provide this access. But however it is done, that access should be provided to the students of India.

To answer these questions I have begun to raise the issue with eminent lawyers, vice chancellors of universities, scientists, scholars, and librarians, asking them if they see a path forward that would give the students and scholars of India unfettered access to the ocean of knowledge, a path forward

not just for India, but perhaps for the entire world.

## **Removing “salt taxes”**

India has set a path for the world many times in the past. The most famous occasion is when M.K. Gandhi led not only the liberation of India from the shackles of the British Raj but set in motion the decolonisation of the entire world. That process was set on a definite path in 1930, when Gandhi set out for Dandi to make salt from the ocean in protest and violation of the taxes and limits on manufacture imposed by the colonial masters.

High prices and carefully controlled access to knowledge is no different from the taxes and limits on salt. Knowledge and salt are both essential for human life. Sci-Hub has been termed a pirate site by the more polemical critics, but in reality it is an unlicensed salt factory, and the users of that factory are students thirsting for knowledge. Decolonising knowledge and democratising information is the great promise – and the great challenge – of our times. With universal access to knowledge, we can begin to achieve the potential of the Internet and provide a better world for future generations.

With universal access to knowledge, we can provide an opportunity for all to get an education. We can create a better-informed citizenry that will make our democracies more effective. We can accelerate the creation of knowledge and innovation so that we can begin to attack the pressing crises of poverty, hunger, disease, lack of water, the destruction of our environment, the shocking growth in inequality of opportunity.

We should stand up walk with the students and teachers of India and let them swim freely in that ocean of knowledge. It will be good for India and good for the world. Let us all walk down that road to the sea.

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**P.S.**

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