

A research revolution

There was a time, not so long ago, when you actually had to go to a library to read a journal article. If the library did not have the article you needed, you would ask your librarian to source the article and pay for the journal to be loaned to your library.

The internet changed research; providing rapid access to information wherever you could get a telephone signal. Accessing articles instantly meant that it was also easy to share information illegally. To help protect their copyright, major publishers put journal articles behind paywalls (a password protected area to allow only paid subscribers to access website content). In the UK, researchers primarily access journals through organisations such as Open Athens and Shibboleth which allow access to multiple journals. However, this process does not work seamlessly and requires you to often change access keys to access certain journals, depending on what journals your university, hospital or organisation subscribes to.

In developing countries, researchers generally do not have institutional access to most western journals. To get access to the latest articles, researchers can go on forums to ask for digital articles from researchers who have institutional access, or directly from authors using twitter with the #icanhazpdf hashtag.

The 'research revolution' started in 2011 when Alexandra Elbakyan, a researcher in Kazakhstan created Sci-Hub. Sci-Hub is a website which bypasses publisher paywalls. It provides access to nearly every scientific paper ever published immediately to anyone who requests it. The website uses the digital object identifier (DOI) of the article to find and retrieve the original PDF article. Alternatively, you can enter the uniform resource locator (URL) or PubMed identifier (PMID) of the article to retrieve it. You can find the DOI, URL or PMID of the files you are searching for in PubMed or any other research database. Currently, there are more than 58 million articles in the database.

The website has a similar layout to Google's homepage with a simple search field. When you enter the DOI, PMID or URL the website attempts to download a copy from the LibGen database of pirated journal content. If the content is not present, the website automatically redirects through the publisher's paywalls using access keys donated by academics in



paying institutions. The LibGen database is updated simultaneously with the requested paper. Crucially, from a user's perspective, it is easier to access an article on Sci-Hub than through the publisher's own website.

Sci-Hub is illegal. It breaches the publisher's copyright by illegally reproducing articles from publishers' websites. On its own website, Sci-Hub openly "advocates for the cancellation of intellectual property, or copyright laws, for scientific and educational resources". Sci-Hub has had one domain name removed in a lawsuit filed by Elsevier in the USA. However, it has multiple backup plans and is actively using an alternative domain name.

The tide is gradually turning towards an open access model in academia. The increasing costs of journal access for libraries, in combination with cuts in funding are forcing libraries to cut expensive journals from online access. Open access journals, such as PLOS ONE are rising in popularity. Funding organisations such as the Wellcome Trust are banning publications in closed (behind paywall) journals.

Morally, is it right that large private organisations own the rights to the research of academics? The research is funded by taxpayers, charities, and industry. Experiments are frequently performed on human subjects who have entered randomised controlled studies for the benefit of mankind. Yet, the research cannot be read without paying to access the article, even by the individuals involved in the trial or their descendants.

Academics do not gain financially from publishing papers, only publishers do. So why do academics hand over their work to publishers to profit from their work? Large publishing groups own most of the high impact journals, and publishing in these journals is crucial to keeping an

academic job or gaining promotion within an academic institution.

Pirate organisations like Napster and The Piratebay changed the face of our music, TV and movie industries. They enabled the rise of well designed, legal download and streaming services and have generally reduced the cost of consumer access to music, online television and movies. Due to a combination of convenience and lower cost, download and streaming services have rapidly replaced the buying of media in physical shops.

Sci-Hub has already changed academia, enabling anyone with a computer to access virtually any digital journal article, anywhere in the world. Sci-Hub faces a battle that is arguably far more important for humanity than the pirating of multimedia. A battle for free access to human knowledge. Even if Sci-Hub does not survive in its current form, the revolution Alexandra Elbakyan started will be felt long into the future. In the words of Ernesto 'Che' Guevara "The revolution is not an apple that falls when it is ripe. You have to make it fall."



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