Open source, open access and software patent for scholarly publications: Implications for developing countries

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Abstract. Scholarly publishing has been extensively used by many generations of scholars for self promotion and publicity, networking, the creation and development of new knowledge, announcement of ownership of research output, justification for funding, and proof of the existence of a scholar or department/research unit, among other reasons. Although, scholarly publishing is not a new concept, accessibility of scholarly publications through open access and open source is, and many scholars still struggle to embrace it for promoting the dissemination and visibility of their research output in developing countries. Open access and open source software have made research articles in all academic fields freely available on the internet, allowing reuse, the right of any one to reproduce and redirect the original article without the publishers consent. These positive traits have been challenged by software patents. This paper discusses various issues and challenges of e-scholarly publications, focusing on open access, open source software and software patents and its implications for developing countries.

Keywords: Open source, open access, software patent, scholarly publications, developing countries.

INTRODUCTION

Scholarly publications have increased significantly with the evolution of information technologies and communication networks, increased literacy and the commercialization of these important educational activities and facilities. Since the famous Gutenberg Press in 1440, publications have continued to proliferate with the Internet becoming the greatest publishing medium of all time. As such, the publishing industry which now spans three main categories – general, commercial, and academic, is swiftly moving away from print to electronic publishing, and from small or personal publishing initiatives, thereby introducing new challenges. The purpose of scholarly publishing is to promote and support scholarship, research, and academic or learning activities. A large number of scholarly publications now occur in both print and electronic format, and web-based publications are growing increasingly popular in the academic community for the rapid dissemination of research results. According to Mabawonku (2005), most scholarly publications differ from other types of publications because of its characteristics. Most scholarly publications are conveyors of scientific research output and there are specific requirements for such output to belong to the scholarly output category, such as research quality and rigour, audience, readability and originality, and so on. Scholarly publications are made easily accessible to the users through open access and open source initiatives.

Open access to scholarly publications has been a topic for debate among scholars and publishers over the last few years. It is a model adopted by many international and inter-governmental organizations, such as World Summit on the Information Society (WSIS), for disseminating full-text contents to online communities

(Josiah, 2008). It is an effort to make research articles in all academic fields freely available on the internet, allowing reuse, the right of any one to reproduce and redirect the original article without the publishers consent (Sinha, 2008; Hoorn and Graaf, 2006; Goodman, 2004). Open access publications are those made freely available online to people with no charges impose for access (Albert, 2006). This is made possible by open source software which is computer software that the source code and other certain rights normally reserved for copyright holders are provided under a software license that permits users to study, change, and improve the software.

Contrary to the business mode of scholarly publishing that increases the information access gap between developed and developing countries, open access provides the visibility and accessibility to research output without restrictions. Despite the promising potential for open access to improve scholarly communication, this mode of publishing is not yet wide spread in developing countries when compared to developed countries (Moller, 2006; Wang and Su,2006; Directory of Open Access Repositories (DOAR), 2010). The limited adoption of open access in developing countries as well as the absence of specific detailed studies addressing the awareness, acceptance and usage of open access scholarly communication in developing countries like Nigeria motivated this study.

Open Source Software: An Overview

Several definitions abound in relation to the concept of open source software. Perens (2000) describes open source software as a broad general type of software license that makes source code available to the general public with relaxed or non-existent copyright restrictions. Open source is a way of creating and distributing software (Evans, 2003). Rather than keep the human-readable program instructions (called source code) hidden from users, it makes the source code available to users. This access enables skilled users in programming to become de facto software developers by adding to or modifying the software code and then redistribute it. Open source software is not licensed to individual users or companies in the conventional fashion. Users can share the software with others if they choose. Open-source software refers to software for which the source code (underlying programming code) is made freely available for use, reading the code, changing it or developing further versions of the software, including adding amendments to it. Open source software is often used as a general expression for many forms of non-proprietary software, which differ principally in respect of the licensing terms under which changed versions of the source code may be further distributed. Open source software is software that includes source code and is usually available at no charge. There are additional

requirements besides the availability of source code that a program must meet before it is considered as open source. The requirements include that the software must be free to redistribute; derivative works must be allowed; the license cannot discriminate against any persons; and the license cannot discriminate against any fields of endeavour. Software that is licensed under an open source license allows for a community of developers from around the world to improve the software by providing enhancements and bug fixes. Open source usually refers to an application whose source code is made available for use or modification in line with users' needs and requirements. Open source software is known with some characteristics which make it distinct from proprietary software. According to gbdirect (2011) the characteristics include:

Source code

Open source software comes with the source code, and allows distribution of same. Where some form of the product is not distributed with the source code, there is a well publicized means of obtaining the source code which is usually downloaded via the Internet without charge. The source code is provided in the form in which a programmer would be able to modify the program. Obscure source codes or intermediate forms such as the output of a pre-processor or translator are not allowed for open source software.

Free redistribution

The license does not restrict any party from redistributing or giving away the software as a component of an aggregate software distribution containing programs from different sources. The license does not require a royalty or other fee for such distribution.

Derived works

The license allows modifications and derived works, and also allows them to be distributed under the same terms as the license of the original software.

No discrimination against persons, groups and fields of endeavour

The license does not discriminate against any person or group of persons. It does not also restrict anyone from making use of the program in a specific field of endeavour.

License must not restrict other software

The license does not place restrictions on other software

that is distributed along with the licensed software.

License must be technology-neutral

The provision of the license is never predicated on any individual technology or style of interface.

Open access initiatives

Open access (OA) is an alternative form of scholarly communication that has emerged from the traditional business mode of scholarly publishing. The basic concept of open access is the online accessibility to scientific literature for readers at no charge and without any technical barriers (Mann et al., 2008). Developments in information and communication technologies (ICTs) have been cited as among the key factors that have catalysed the emergence of open access (Ngétich, 2004; Adogbeji and Akporhonor, 2005; Moller, 2006). It is currently estimated that only 15% of the annual research output is immediately made freely available through open access (Brody et al., 2007; Bjork et al., 2009). This simply means that a greater portion of the research output is still published using the conventional system.

Open access basically calls for scholarly publications to be made freely available to libraries and end users. The growth of the open access movement is partially in response to the enormous costs of many scholarly journals. With traditional journal publication methods it is not uncommon for an institution to have to pay for an article twice. First they pay scholars to produce the work and then the institution's library pays to purchase the work back from the journal publisher. Anderson (2004) was of the view that there is no such thing as free information and that there are costs involved in producing scholarly information. However, with the advent of new technologies and software programs, it is becoming increasingly less expensive to compile and distribute scholarly information. One of the great benefits to open access is that libraries in smaller institutions or in economically disadvantaged areas around the world can have greater access to these scholarly resources.

Open access helps to ensure long-term access to scholarly articles. Unlike articles that are licensed in traditional article databases, libraries and others can create local copies and repositories of these resources. Libraries, by working together to make repositories of open access literature, can ensure continued access to these scholarly publications into the distant future. Thus, various initiatives, statements and declarations have been made at national and international levels to speed up the spread of open access. One of these is self-archiving of scholarly publications by institutions and individual researchers and the creation of institutional repositories.

The level of open access initiative in Nigeria can be said to be at conception. Gbaje (2009) survey revealed that Nigerian scholarly publications suffer low visibility. Utulu and Bolarinwa (2009) studied Nigerian academics adoption of open access and revealed that there was insignificant use of open access and that few academics who adopted open access were more from the science faculty than from the humanities. Their paper revealed academics' perception, publishing culture, and unawareness as factors hindering the adoption of open access initiative in Nigeria. In fact, open access success lies on digital archives and repositories. Open access helps to ensure long-term access to scholarly articles. This is made possible by open software but the issue of software patents is of concern to the academic community.

Software patents

A patent is a set of exclusionary rights granted by government to a patent holder for a limited period of time, usually 20 years from the earliest effective filing date of the patent application. Software patents are different from copyright or trademarks despite being lumped together with them under the collective term intellectual property. Software patents are relatively recent phenomenon and its evolution heightened the tensions between open source and proprietary software in the 1990's.

Software patent is a global problem, though the risk is not uniform across the entire set of issued patents. Many software patents are of dubious enforceability because they are too vague or claim inventions that are already disclosed by prior act. Insofar as patents are concerned, the debate focuses mainly on the question of whether patents are rather a hindrance or an incentive for the software industry. Generally speaking, opponents of software patents claim that such patents are an obstacle not only to open or free software, but in respect of the whole software industry. In their view, software patents give excessive control over the technology to patent holders. The patents increases cost and block a smooth expansion of the software industry, which may only continue to evolve in an environment where software is mutually shared and jointly developed. In addition, it criticizes the duration of patents in respect of software as being too long for the short life of most software. Supporters of software patents assert that the patent system encourages innovation, treatment of software - related inventions together and giving the software inventors the right to recuperate their investments. Some also believe that the proprietary and the open source model can coexist, and indeed, a number of companies seem to combine, in their business strategy, both open software options and a proprietary software.

When assessing these different models, various factors may be considered, such as how the open source solution compares to proprietary software in technical terms, what are the overall costs, or whether the compatibility with

other programs and applications is satisfactory in view of the intended use.

Open source software and proprietary software: comparism

Cost

One of the most obvious advantages is the initial cost. Open source software is generally available for free (or at a minimal cost) and it is not necessary to purchase additional licenses for every computer that the program is to be installed on or for every person who is going to use the software. Open source software not only has a lower acquisition cost than proprietary software, it often has lower implementation and support costs as well. Open source software are provided free of royalties and fees. Administrative overhead cost is drastically minimal as there is no cost attached to number of copies in use, unlike when proprietary software is used. There is also lower management cost as no upgrade fees are incurred. Near-zero vulnerability to virus eliminates need for virus checking, data loss and downtime (Ukachi, 2011).

Evaluation

It is easier to evaluate open source software than proprietary software. Since open source software is typically freely available to download, librarians and systems administrators can install complete production-ready versions of software and evaluate competing packages. This can be done not only without any license fees, but also without having to stick to a vendor's trial period, evaluate a limited version of the software, or deal with the vendor's sales personnel. If the library likes an overall open source package but would like a few added features, they can add these features themselves. This is possible because the source code is available. Even if a library does not have in-house expertise, they can benefit from source code availability because another library may be able to provide them the fix or they can hire a consultant to make the changes that they desire. Fuchs (2004) pointed out that if a proprietary program "is deficient in some way, the user must wait until the vendor decides it is financially viable to develop the enhancement of an event that may never occur." With open source software the users can develop the enhancement themselves.

Support services

Open source software allows for more support options. Proprietary software vendors often package service with the product. This is particularly true of proprietary library-specific software. When support from a vendor is inadequate, it is an additional expense to purchase another tier of support, assuming that it is even available. Open source software allows for different vendors to compete for support contracts based on quality of service and on price. Access to the source code also allows for self-support when practical and desired. The amount of vendor lock-in is dramatically reduced with open source software. The large initial costs often associated with proprietary software makes it difficult to re-evaluate the choice of software when it does not live up to expectations. Proprietary software can lead to a single point of failure. If a vendor goes out of business or decides not to support a program anymore, there is often nothing a user can do. Organizations using the software could provide self support or other vendors can come in and fill the void left by the previous vendor if the program were available as open source software (Albert, 2006).

Flexibility

Open source software offers more flexibility and freedom than software purchased with license restrictions. Both the open source software programmers and the user community share and promote open standards and believe in sharing. Open source softwares are very often developed in a public, collaborative manner. The pattern with proprietary software is typically that a defect reports need to be filed and the there will be delay before the vendor determines when or whether to issue an updated release. Users of proprietary software are much more at the mercy of the vendor's internal processes than with the open source arrangement (Ukachi, 2011).

Auditability

A rarely understood benefit of open source software is its auditability. Proprietary software forces its users to trust the vendor when claims are made for qualities such as security, freedom from backdoors, adherence to standards and flexibility in the face of future changes. If the source code is not available, those claims remain simply claims. By publishing the source code, authors make it possible for users of the software to have confidence that there is a basis for those claims. Without access to the source, third party inspection is impossible (Ukachi, 2011).

Stability

Proprietary software vendors can apply a number of tactics to persuade their customers to upgrade more or less willingly. Typical tactics include moving to allegedly new and improved file formats (which require the new and

improved software to read them) or to withdraw support and bug fixes for older versions after a short period. The problem for users of such software is that they rarely have much control over that process and are left isolated if they choose to remain with the older versions. This has cost and control implications (Gbaje, 2009).

Impact of open access for developing countries

Copyright has been the dominant intellectual property rights issue confronting academic in developing countries. The copyright issues that are of importance to scholars include fair use or fair dealing, ownership, rights, duration, protection, registration and permission. There are varying standards of copyright ability in different countries. As such, it is important for an institution to let its constituency fully understand the intricacies of the copyright law of its country.

Libraries in the developed world struggle to purchase access to all publications they need while subscriptions are prohibitively expensive for institutions in the developing world, particularly in Sub-Saharan Africa in general and Nigeria in particular. Developing countries are now posed with the challenge of either becoming an integral part of the knowledge-based global culture or face the real danger of finding themselves on the wrong side of the digital divide. But the enabling Information and Communication Technologies (ICTs) have prompted the scholarly community to devise an alternative scholarly publishing system whose aim is to achieve a wider distribution of scholarly content without price or other copyright restrictions to end users (Dulle et al., 2010). This is for the fact that the right of access to information, according to Musakali and Rotich (2009) has become the dominant right in the information and knowledge era.

The current structure and practice of copyright, with respect to its tight grip of scientific publications, have made the concept look misleading, copyright was actually well intended. Copyright was instituted to protect the owner of an intellectual property, but it is today a bug business (Dulle et al., 2010). This is because authors own the original copyright in their works. In the process of publishing, authors can transfer to publishers the right for publishers to post the work freely on the web, or authors can retain the right to post their own work on institutional or disciplinary servers.

Nevertheless, open access presents an opportunity for developing countries to participate in the global information-based socio-economic and political activities. The impact of open access on the development of scholarly publications in developing economies cannot be over emphasised. Although Okoye and Ejikeme (2011) discovers that Nigerian librarians are aware of open access Channels but their failure to utilize the medium in publishing suggests that they should get acquainted with the initiative and also disseminate it by organizing workshops/seminars and invite foreign advocates and experts in the project.

Open access allows broader and faster opportunities for researchers from any country to publish their work. Both through new journals and through online self-archiving, academics can now make their work available to other readers anywhere in the world. From a community perspective, Open Access also empowers the society. It naturally improves communication through open distribution. By doing that, Open access can foster partnerships, strengthen institutional cooperation and collaborative approaches to face problems that are common to some developing countries, such as AIDS, Ebola Virus and the neglected diseases.

CONCLUSION

As more papers are deposited and more scholars use the repository, the time between an article being deposited and being cited has been shrinking dramatically, year upon year. This is important for research uptake and progress because it means that in this area of research, where articles are made available either frequently or before – publication, the research cycle is accelerating. Open access and open source software are increasingly the catalyst behind scholarly publishing phenomenal growth, mainly because of web-based publications. However, there is animosity and disgust in the free software community towards software patents. Much of this has been caused by free software or open source projects terminating when the owners of patents covering aspects of a project demanded license fees that the project could not pay, or was not willing to pay, or offered licenses with terms that the project was unwilling to accept, or could not accept, because it conflicted with the free software license in use. Open source software advocates have advanced a number of arguments against software patents over the years. Their attacks ranges from the procedural to the theoretical (software development is a sequential process, so allowing patents will lead to an innovation stifling thicket of intellectual property rights). Admittedly, problems do exist, but in the end, there is a need for reform so as to encourage research. Universal access to knowledge – with full freedom to localize knowledge – is not just a matter of development, science, or security. It is a matter of the right to development. Open access represents a very important step to ensure the international knowledge access and transfer. Open Access fulfils this right in support of human enrichment and health. This is one of the pre-eminent methods to achieve the human rights goals and bridge the divides, digital and physical, between the developing and developed worlds.

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