

‘Open Access to Journal Content as a Case Study in Unlocking IP’

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1. Introduction

Access to content is vital, for a variety of cultural and economic reasons. The Internet ushered in a new era of accessibility, and in the process challenged existing publishing technologies and the business models that had grown up around them. Fifteen years into the revolution, a few market segments are sufficiently mature that retrospective analysis is appropriate. This paper performs a stocktake in relation to one such segment: refereed journals and journal articles.

The journal is the primary formal publishing channel in many disciplines, but in some it is not. The analysis in this paper is broadly applicable to some other collections of refereed papers, particularly refereed conference proceedings. However, it does not consider scholarly books, nor works in the depictive and performative arts. The simplifying assumption is made that papers have a single author, in order to avoid the complexities of syntax that would otherwise arise.

It is useful at the outset to distinguish several broad categories of publishers.:

- 'mutuals'. These operate as not-for-profit organisations, and in many cases are not even incorporated. Revenues from these operations are low or even non-existent, and most activity is subsidised, primarily by individuals and universities;
- for-profit corporations. These have become dominant in many segments;
- segments of 'learned societies'. This term encompasses disciplinary and professional associations and other forms of institutionalised scholarly communities that transcend the boundaries of universities. In some segments, these are dominant;
- universities. A small number of journals are run by universities (particularly by law faculties).

The cost-profiles of these various categories were assessed in [Clarke \(2007b\)](#).

Learned societies may budget to run their journal publishing activities at a loss (by subsidising them from other revenues, such as membership subscriptions), at break-even, or at a profit. If they make a profit, the excess is available for allocation to other activities. For the purposes of the analysis undertaken in this paper, for-profit publishing includes not only publishing by for-profit corporations (referred to where necessary as 'commercial publishers') but also profit-making publishing by learned societies.

The paper commences by reviewing the nature of the journal prior to the widespread availability of the Internet. It highlights key steps in the interwoven processes of the open access and repository movements and the adaptative behaviour of for-profit journal publishers.

The following section provides a framework for the analysis. It does so by identifying the key aspects of the unlocking of intellectual property (IP) necessary to facilitate open access to content (OA). The scope for genuinely value-adding activities by publishers is then considered.

A review of the current scene is then undertaken, focussing firstly on the OA credentials of journals as identified by the SHERPA/RoMEO undertaking, and secondly on an empirical study of journals in the information systems discipline. This is complemented by consideration of three specific cases. An assessment is then provided of the extent to which the theoretical openness of access to refereed papers is being exploited in practice.

2. The Changed Nature of Journals

This section provides a brief review of journal publishing patterns in the period prior to and shortly after the electronic publishing revolution that was unleashed by the widespread availability of the Internet.

2.1 The Scene in 1995

In [Clarke \(2005a\)](#), the interests that authors have in publishing papers in journals were distilled down to the following:

- gain the recognition of one's peers;
- gain citations in relevant literatures;
- develop personal reputation;
- enhance the likelihood of having research grant requests approved;
- enhance recognition by potential employers; and
- contribute to organisational reputation.

Contrary to the assumptions sometimes made, most academics have little interest in wide dissemination of their work. What matters to them is that it is discovered, seen, and valued, by the small group of targeted readers who the author believes can understand it, and who actually matter to the author.

The interests that consumers have in journal papers are quite different from those of authors. They were summarised in the same paper as follows:

- gain access to relevant information and ideas;
- gain access to exemplars;
- avoid barriers, such as the delay and inconvenience involved in negotiating a copyright licence;
- sustain a sense of community; and
- gain access to precise citations and references.

Journals need to service both the supplier and consumer groups. [Clarke & Kingsley \(2008\)](#) described the functions of a journal in the period 1950 to 1995 as combining:

- a quality assurance (QA) mechanism;
- a publication channel;
- an archival mechanism; and
- a discovery mechanism.

The QA of individual papers has been (and continues to be) performed almost entirely by academics, although in some cases publishers have provided some amount of editorial assistance, directly and/or by funding administrative support staff working adjacent to editors.

Archival aspects have been performed by libraries, primarily in universities and the public sector. Discovery of relevant articles has been to some extent facilitated by publishers but to a large extent by third party collection-consolidators and libraries. The primary contribution of publishers has been to the publication aspects of the undertaking.

Moreover, the QA, archival and discovery functions have been performed with little or no direct recompense by any party, i.e. primarily by subsidy from individuals, universities, governments and to a limited extent corporations. Publisher contributions have been small. Yet all revenues and profits have accrued to the publisher. (In a minority of cases, some profit-sharing has occurred, to the benefit of learned societies).

During the period 1950 to 1995, the number of journals exploded. Admittedly, the number of scientific papers published annually has been doubling every 10-15 years for two centuries (Odlyzko 1995). To accommodate this, journals have increased, to some extent in size, but to a considerable extent in number. In recent decades, the sustained proportional increase has been on an ever-larger base, so the number of new journals launched each year or decade is now very high.

At the same time, the penetration of for-profit corporations into the field exploded as well. Editors and learned associations had less understanding of the significance of intellectual property (IP) ownership than did their service-providers. Legal control of a great many journals was ceded by the academic sector to the publishing sector. In the field of economics, for example, by the late 1990s, two-thirds of journals were controlled by commercial publishers (Bergstrom 2001). As the industry matured, consolidation naturally occurred, and the concentration became so great that, by 2005, the top 11 publishers were publishing more than 70% of the journals in the sciences ([Ware 2006](#)).

From about the end of the 1970s, that dominance was turned into super-profits. Publishing companies utilised their monopoly advantage to progressively raise prices (Bergstrom 2001). They also bundled journals in such a manner as to maximise the revenue that they could extract from subscribers. This strategy was highly successful, and achieved of the order of 60-70% market penetration ([Nicholas et al. 2005](#), Hahn 2006). Between 1984 and 2002, the price of science journals increased by a factor of nearly 6, or over 5 times the increase in the Consumer Price Index ([Warlock 2004](#), [bepress 2005](#)).

The key subscribers are, and remain, libraries, particularly university libraries. They felt enormous pressure on their budgets ([UCal 2004](#), [Gasson 2004](#)). They lacked the power to do anything about it, however, because universities have generally played quite limited roles in journal-publishing, and access to journals by their staff was a quite fundamental requirement.

2.2 The Internet Era and Open Access

The Internet created a great many new possibilities for the dissemination of and access to publications. With it came high expectations, reflected in the term 'electronic frontier' - as famously argued in [Barlow \(1996\)](#). For a review of the aspirations, see [Clarke \(2001\)](#). Critical among the expectations was greatly enhanced freedom of access to information, summed up by the call-to-arms 'information wants to be free' - which was actually a corruption of the original, more complex statement 'information wants to be free; it also wants to be expensive' [Clarke \(1999\)](#).

Technical disciplines (particularly computer science and physics) were well-advanced in exploiting the opportunities by the time that the Internet became commonly-available from

about 1994. Since about 2000 all disciplines have been distributing material electronically. Many new 'pure eJournals' have emerged, some existing journals have converted from print-only to electronic-only, and almost all of the remainder are available in both forms. In the Information Systems (IS) discipline, for example, the count of electronic-only journals grew from 102 to 131 between April 2007 and March 2009, double the growth-rate of paper-only and paper-and-electronic journals. (See [Exhibit 2](#)).

What had once been referred to by such terms as 'working papers' became 'ePrints' - "the digital text of a peer-reviewed research article, ... before and after refereeing" ([ePrints.org 2005](#)). Two kinds of ePrints are commonly distinguished, and a third, related form is usefully juxtaposed against them:

- 'a PrePrint'. This is a stage of a work-in-progress. Multiple versions may exist, e.g. prior to and after one or more presentations, and prior to and after one or more rounds of refereeing;
- 'the PostPrint'. This is the author's own copy of the final version, which has been accepted by the journal and forwarded to the publisher. In practice, it may be the last PrePrint, re-purposed because it was accepted without change;
- 'the Publisher's Copy'. This is the version that appears in the journal, and which incorporates the publisher's investment in presentation, production-editing and branding.

Authors may perform what is often misleadingly called 'self-archival' but is better described as 'self-deposit'. Self-deposit can be in the author's own repository (as is the case with this paper). For long-term accessibility, one or more institutional repositories are preferable, by which is meant here a repository run either by a university or some other research-oriented employer or by a learned society (as that term was defined earlier in this paper). This has been supported by the ePrints movement ([Harnad 2002](#)).

Uptake of the opportunity to self-deposit into institutional repositories has been slow, however. There have been some barriers to self-deposit, to some extent in the imaginations of authors, but also to a considerable extent real. The OA movement emerged to address the impediments. What is usefully referred to as 'core OA' requires 'free and unrestricted access' to content without 'price barriers' or 'permission barriers' ([Budapest 2002](#), [Suber 2004-](#)). For fuller discussions, see [Suber \(2002\)](#), [Willinsky \(2003\)](#) and Willinsky (2006).

Automated tools were developed to support management of the review process, in particular the [Open Journal System \(OJS\)](#), described in ([Willinsky 2005](#)). Discussions took place about business models to support 'content commons' (Lessig 2004, [Clarke 2007a](#)).

It took until about 2005 before governments and research funding bodies finally addressed the accessibility issue - and, indirectly, the monopoly pricing problem - by requiring self-deposit of ePrints into an appropriate repository (e.g. [Wellcome Trust 2004](#), [NIH 2005](#), [RCUK 2005](#), [ARC 2007](#)).

2.3 The Responses of For-Profit Publishers

The renewed emphasis on openness represented an apparent threat to the entrenched position of for-profit publishers. They have adopted various measures to shore up the high levels of profitability that they had achieved.

Some responses have been constructive, particularly in the form of enhanced services such as search facilities, notification/alert services and auto-generation of hotlinks to cited works. These have offered value, but only within the particular publisher's range of journals. From the perspective of each scholarly community, such boundaries are artificial. Moreover, some of these advantages are being neutralised, in part by for-profit companies in other industries such as Google, and in part by the high level of sophistication achieved by open source software and open access services.

Some responses have, on the other hand, been destructively competitive. The American Association of Publishers (AAP) hired a public relations consultant (Giles 2007), which led to the launch of the [Partnership for Research Integrity in Science and Medicine \(PRISM\)](#). This partnership promoted to policy makers "the very real threat to peer review that ill-considered government interference represents, and [the need] to explore the ways in which we can safeguard peer review as a critical component of scientific integrity" (Firestone 2007). This was a seriously misleading assertion, because open access does not in any way threaten peer review (Suber 2006b, 2007). PRISM failed to publicly declare who it was, but it appears that AAP, Wiley, Elsevier and the American Chemical Society were key players (Giles 2007).

A further response was the adoption from learned societies in the sciences of what is misleadingly called the 'author pays' approach. This results in what is sometimes referred to as a (or the) 'hybrid model' for journal-publishing. The choice is offered of either paying an up-front fee, permitting open access to that article, or paying no fee, in which case it is only accessible by subscribers. Springer launched the first such scheme by a for-profit publisher in 2004, at the price of USD\$ 3,000 (King & Tenopir 2004). Other publishers have subsequently set a very wide range of prices. The [SHERPA/RoMEO catalogue](#) offers [a catalogue of publishers that offer the 'author pays' form of OA](#), including their prices. The range displayed on 12 March 2009 was US\$ 150 to US\$ 5,000.

The adoption levels of 'author pays' in commercial journals appears to have been very low, however (ALPSP, 2008). Some journals have resorted to an 'editor's choice' mechanism to ensure that at least some Issues include at least one paper that is openly accessible. It does not appear that the publishers' projection of 'author pays' as a form of OA has to date had the intended effect of dissipating the energy of the OA movement.

Following a decade of desperate concern about the impacts of OA and repositories, it appears that for-profit publishers may be gradually coming to accept that the scene has changed. Openness is making inroads, but this has not to date threatened their existence, and they have to date sustained their high prices and high levels of profitability.

3. The Nature of 'Unlocked IP'

This paper is a contribution to the research domain described by the term 'Unlocking IP'. The focus of researchers in this domain is to contribute to understanding of policy formation concerning the accessibility of materials of all kinds. This section firstly considers the properties of 'unlocked IP' as it applies to referred papers, and then views the issues from the perspective of for-profit journal publishers.

3.1 The Requirements of Unlocked IP

For content of any kind to be accessible, a number of conditions need to be satisfied. One of them is that the business models under which production, publication and consumption are conducted are sustainable. Most of the production and consumption activities have been, and continue to be, subsidised by individuals, employers and the State. Further, as discussed in [Clarke \(2007\)](#), the technical difficulty and the costs of publishing, discovery and access have all decreased dramatically. Some journals and publishers may struggle to survive if they suffer a substantial reduction in revenue. The problem is particularly serious for journals with high cost profiles, which arise variously because of bloated organisations and inefficient practices arising from decades of super-profits, and from inherently high costs, e.g. for clinical testing.

Given a sustainable business model, the requirements of 'core OA' were noted above as being 'free and unrestricted access' to content without 'price barriers' or 'permission barriers'. In the terms used by free software pioneer Richard Stallman, the need is for content to be 'free as in air', but not necessarily 'free as in beer'. However, such price as may apply must not be prohibitive for any relevant category of reader.

Earlier analyses of the needs that the various actors have of copyright licences in refereed papers are in [Clarke \(2005a\)](#) for PrePrints and [Clarke \(2005b\)](#) for PostPrints. The broad licence-specification was summarised as follows:

- the object may be copied in whole, but not in part; and each copy must carry the copyright notice with it, including the means of discovering the terms of the licence;
- reproduction is permitted, but not for commercial purposes;
- dissemination of copies is permitted, but not for commercial purposes;
- adaptation is not permitted;
- there are no limitations on who can be a licensee;
- the licence is not time-limited, and is irrevocable;
- the copyright-owner provides no warranties or indemnities, other than any that may be imposed by law;
- the licence is gratis;
- the power to grant a licence is retained exclusively by the copyright-owner (i.e. no power to sub-license is granted).

For all categories of PrePrint, the two 2005 papers recommended adoption of the least liberal of the Creative Commons licences, '[Attribution - Noncommercial - No Derivative Works](#)'.

The following is a proposed operational definition of the necessary and desirable characteristics of Unlocked IP, in a form that facilitates assessment of the policy statements of journal publishers.

(1) Ownership of the Copyright in Each Collection of Papers

The term 'collections of papers' is used here to encompass journal Volumes and Issues and such similar concepts as are emerging in the digital era, but also collections such as Proceedings, books of readings, and Festschrift.

The terms of ownership must be such that the collections become and remain readily accessible. This can be achieved by the organisation that performs the QA retaining ownership, or by the publisher acquiring ownership subject to conditions that ensure publication and long-term availability.

(2) Ownership of the Copyright in Each Paper

For IP to be 'unlocked', the author must retain sufficient rights in relation to the work. This can be achieved in two broad ways:

- by the publisher acquiring copyright from the author, but granting a licence back to the author that is sufficiently liberal that ongoing accessibility is enabled; or
- by the author retaining copyright, i.e. not assigning or transferring copyright in the paper to the publisher, but rather granting a licence to the publisher that is non-exclusive, but sufficiently substantial (and hence constraining on the author) that the publisher is able to operate an effective business (whether for-profit or not).

Further details on relevant aspects of such licences are provided in the following sub-sections.

(3) Accessibility of PrePrints

The terms of the agreement between author and publisher must enable PrePrints to be accessible, i.e. prior versions up to but excluding the final version accepted by the journal and forwarded to the publisher.

In practical terms, this needs to include the right to place PrePrints, and to leave PrePrints, in all of:

- the author's own electronic repository/ies;
- repositories of the author's employer(s) or affiliated institution(s); and
- repositories of the author's learned society/ies.

On the other hand, it would be entirely reasonable for the publisher to impose a requirement that the author link closely-related PrePrints forward to the Publisher's Copy.

(4) Accessibility of the PostPrint

The terms of the agreement between author and publisher must enable the PostPrint to be accessible, i.e. the author must be free to self-deposit the final version accepted by the journal and forwarded to the publisher into any and all of the categories of repository listed in the previous sub-section.

It is necessary (or at least highly beneficial for the publisher) for the author to accept a number of constraining terms:

- the author must display an appropriate copyright notice (preferably with a link to the licence and/or further information about licensing). This may involve changing the identity of the copyright-holder;
- the author must provide accurate citation of the published work;
- to facilitate access to the published work, the author must provide a link to at least the journal, e.g. the contents-page of the issue in which the paper appears. It is highly desirable that a reliable identifier be provided (such as the DOI) and/or that a link be provided to the published work, whether or not there are 'price' or 'permission' barriers that have to be negotiated in order to achieve that access.

(5) Accessibility of the Publisher's Copy

Provided that the conditions specified in this section are satisfied, it is only desirable and not essential that the Publisher's Copy be freely accessible without 'price' or 'permission' barriers.

Useful though it may be, it is not even essential that the Publisher's Copy be freely accessible after the elapse of some period (such as 6 or 12 months after publication). If PrePrints and PostPrints are openly accessible, then market conditions can be left to determine whether or not access to the formal version of the work has a price-tag placed on it, and, if so, how much and for how long.

(6) Copying

The terms of the agreement between author and publisher must permit PrePrints and PostPrints to be copied by any party.

On the other hand, copying may be subject to constraints such as limited numbers made by any one person, and no commercial use (e.g. for sale or use in marketing).

Provided that the conditions specified in this section are satisfied, it is only desirable and not essential that the Publisher's Copy of the paper be copiable, nor even that it be copiable after the elapse of some period (such as 6 or 12 months after publication).

(7) Republication

The terms of the agreement between author and publisher must enable the PostPrint to be republished by any party in a subsequent collection, without any right of veto on the part of the original publisher.

This may be subject to reasonable constraints, such as proper citation, display of copyright ownership and where to seek a licence, and a fee - provided that it is sufficiently modest to not represent a barrier to publication.

3.2 The Contribution of Publishers

That for-profit journal publishers have exploited their monopoly power is well-established. What is less clear is how important their financial survival is to the academic endeavour. In order to throw some light on this aspect, it is necessary to consider what their 'value-add' is, in the conditions that prevail a decade into the 21st century and 15 years after access to the Internet became widespread.

Key aspects of publishing for which the publisher may take responsibility are listed in Exhibit 1.

Exhibit 1: Key Costs and Risks Borne by the Publisher

- expression of the work
- preparation for publication
- quality assurance (at the production editing level)
- promotion
- logistics
- payment collection
- monitoring for copyright infringement and action in relation to it (although it does not appear that this actually occurs very often)

- monitoring for plagiarism and action in relation to it (although few examples of any such activities are known)
- contingent liabilities, in any jurisdiction whose courts deem the paper to have been published for the purposes of the relevant law (although actual instances appear to be very rare). The risks appear to arise primarily under the following heads of law:
 - copyright infringement
 - breach of confidence
 - defamation
 - negligence
 - negligent misstatement
 - misleading or deceptive conduct
 - contempt of court
 - censorship
 - discrimination
 - racial vilification
 - harassment
 - privacy

In [Clarke \(2007b\)](#), however, it was concluded that those were not the reasons why the cost-profiles of for-profit publishers are significantly higher than those of mutuals and even of learned societies that publish other than for-profit. Rather, the cost-differential arises from far greater investment in the following functions:

- competitively-oriented marketing;
- brand management;
- customer relationship management;
- content-protection;
- lobbying (e.g. for favourable changes to law, and against OA); and
- profit-making.

For-profit publishers' primary offerings are assured presentation quality, outsourced production processes (although these processes are far less obscure, challenging and expensive than they were two decades ago), management and protection of the 'brand', the sale of subscriptions and renewals, and the collection of the resulting revenue. Publishers exercise control over the back-issues of journals in which they hold copyright; but this is a negative rather than a positive reason for university libraries to buy subscriptions, and no reason for an author to choose a journal as the venue for their next paper. In short, none of the key offerings of for-profit publishers are of any significant benefit to authors, nor to universities, nor to learned societies (with the exception of profit made by learned societies and applied to related purposes, or at least shared with them).

One area that attracts some editors and their Boards, and perhaps some reviewers and authors, is the provision of infrastructure to support the management of authors' submissions and the workflow involved in review and subsequently production. This is, however, a highly competable area, not only from other publishers, but also from open source products, particularly the [Open Journal System \(OJS\) \(Willinsky 2005\)](#).

Publishers can offer further services, which may sustain their ability to demand high premiums for subscriptions. For example, they can provide repository services, perhaps for 'grey literature' - which is a term currently in use for supporting materials, such as the detailed data arising from experiments and surveys. They can also offer fee-for-service repository operations, saving authors, universities and learned societies the effort and cost of running

their own. The primary offering in this area at present is from the still-relatively-young publisher, bepress.

A potential threat to commercial publishers is that at least some journals may be deconstructed into 'separates'. Under this arrangement, a journal would issue a signed certificate to the author of each paper that passes the reviewing process. The journal then need comprise no more than a contents-page identifying and linking to the widely-dispersed locations in which the approved papers are stored - although archival arrangements would be beneficial to ensure that survival of the papers is not threatened by author laziness or the disappearance of repositories (Ginsparg 1994 re arXiv.org, [Odlyzko 1995](#), [Smith 1999](#), [Smith 2000](#), [Kingsley 2007](#)).

A service of potentially much greater interest to readers is the generation of hotlinks within articles, and hence assistance in navigation around a corpus of cited and otherwise associated papers. The value of that additional service increases as the scope of the corpus extends from merely the journal, to all journals within that publisher's stable, and perhaps out to all OA journals - or even all journals, if a collaborative approach were taken among journal publishers. The inverse offering is also possible, providing access to places where a given paper has been cited, or (with more difficulty and less confidence) where particular concepts or ideas have been used.

The motivations of authors primarily have to do with exposure (judged above all by the relevance of the audience, and less crucially by its size), and the quality of the venue (as determined by the editor, the editorial board and the quality and citation-levels of prior publications, not by the name of the publisher). Readers are interested in the quality of the venue and the relevance of the paper to their current interest. It is unclear to what extent academe is improved by the current offerings by for-profit publishers, nor the extent to which academe is prepared to pay more for them (or even as much as they currently pay). Publishers may need to offer not only lower prices, but also more imaginative and more highly value-adding services.

4. Measures of Progress

The remainder of this paper applies the requirements of Unlocked IP, as defined above, in order to assess the extent to which open access to journal content has been achieved to date. The first sub-section below considers progress in the enablement of open access through the adaptation of copyright arrangements, and the second sub-section presents multiple measures of the extent to which the new possibilities have been exploited.

4.1 Progress in the Unlocking of IP

No one measure is sufficient to define how far the liberalisation of copyright arrangements has gone. This sub-section commences by summarising the available information about the policies of publishers and journals generally, and then presents an analysis of progress within one particular discipline. Those 'macro' views are then complemented by three case studies, one each of a learned society which publishes journals as a service, of a for-profit corporation, and of a learned society whose journal-publishing is dependent on revenue from subscriptions and sales.

(1) The OA Credentials of Journals Generally

For some years, the OA movement has documented the degree of openness of the copyright policies of journals generally. This is recorded in the [SHERPA/RoMEO catalogue](#). This currently categorises journals into four groups:

- [Green](#) - allows self-deposit of both pre-prints and post-prints;
- [Blue](#) - allows self-deposit of post-prints but not pre-prints;
- [Yellow](#) - allows self-deposit of pre-prints but not post-prints;
- [White](#) - does not allow self-deposit.

The SHERPA/RoMEO site appears not to include an auto-generated summary. At the level of journals, the Open Access Newsletter reported in January 2008 that 91% of 10,000 surveyed journals support self-archiving ([Suber 2008](#)). The ePrints site presents a [statistical summary](#), which, in March 2009, indicated that, of 523 publishers, 51% were 'green', 12% 'yellow' and 37% 'white'; but many 'white' publishers were small because, of about 10,000 journals, 63% were 'green', 32% 'yellow' and only 5% 'white'. Even allowing for the mechanism being based on self-reporting by publishers, for some uncertainties and ambiguities in definitions, and for the total population of journals being much larger (somewhere between 30,000 and 40,000), it appears that, at a macro level, OA has achieved strong penetration.

(2) The OA Credentials of Information Systems Journals

Within the first-named author's primary discipline of IS, a comprehensive catalogue of relevant journals is maintained by John Lamp, at Deakin University. A summary table was presented in [Clarke & Kingsley \(2008\)](#), which showed the then penetration of electronic accessibility and OA. Exhibit 2 below presents an expanded version, including more recent data.

Exhibit 2: Penetration and Growth in OA in the IS Discipline

IN APRIL 2007	COUNTS			PERCENTAGES		
	OA	Sub	Total	OA	Sub	Total
Paper-Only	1	39	40	0.2%	6.9%	7.1%
Electronic-Only	74	28	102	13.1%	5.0%	18.1%
Both	41	382	423	7.3%	67.6%	74.9%
	116	449	565	20.5%	79.5%	100.0%

IN MARCH 2009	COUNTS			PERCENTAGES		
	OA	Sub	Total	OA	Sub	Total
Paper-Only	0	45	45	0.0%	7.0%	7.0%
Electronic-Only	101	30	131	15.6%	4.6%	20.2%
Both	49	422	471	7.6%	65.2%	72.8%
	150	497	647	23.2%	76.8%	100.0%

CHANGE	COUNTS			PERCENTAGES		
	OA	Sub	Total	OA	Sub	Total
Paper-Only	-100.0%	15.4%	12.5%			
Electronic-Only	36.5%	7.1%	28.4%			
Both	19.5%	10.5%	11.3%			

29.3% 10.7% 14.5%

Some inferences from the data are that,, among IS journals:

- Paper-Only journals still constitute 7% of the total (unchanged), and are (and have to be) subscription-funded;
- journals available in both electronic and paper forms remain 90% subscription-funded;
- Electronic-Only journals have been the major growth area - 36% in 2 years, cf. 11%. About 40% of the growth appears to have arisen from the belated inclusion of about 30 pre-existing journals; so 21% cf. 7% growth is likely to be more indicative;
- of Electronic-Only journals, 77% are OA (up from 72.5% 2 years earlier);
- OA journals continue to gain ground on subscription journals, but:
 - growth is slow (1.5 percentage-points p.a.);
 - OA journals are mostly in 'new' and 'fashion' areas, and most of the longstanding, large and prestigious journals are among the 77% of journals that remain behind 'permission and price barriers'.

Viewed from the macro perspective, there has been considerable progress in the adaptation of IP arrangements to enable greater openness, although the progress may be much less in the case of well-established, mainstream journals than in newer journals addressing recently-emerged sub-disciplines and research-domains.

It is therefore useful to complement the general impression provided by the macro-data with more specific assessments of the policies of particular publishers. A purposive sample was selected. The first and third are learned societies with somewhat different approaches to their journal-publishing activities, and the second is the largest of the for-profit corporations active in journal-publishing.

(3) IP and the U.S. National Academy of Science (NAS)

The U.S. National Academy of Science (NAS) publishes several series of refereed papers, directly and through affiliated organisations. As a 'learned society' (in the sense used in this paper), it has a strong orientation towards open access.

From 1915 until 1992, NAS did not require transfer of copyright. Indeed, NAS only commenced registering copyright in collections (a peculiarity of US copyright law) in 1978. From 1993 to 2009, NAS policy was to require transfer of copyright (equivalent to assignment under Australian law), but to provide a liberal licence back to the author ([NAS 2004](#)). In comparison with the requirements identified above:

- copyright ownership in each collection satisfied the requirements;
- copyright ownership in each paper was largely satisfied, subject to two qualifications underlined in the following bullet-points;
- accessibility of both PrePrints and PostPrints was supported, in any repository, subject to the proviso that the presentation version invested in by NAS could not be used;
- accessibility of the Publisher's Copy was supported, in the form of a PDF of the paper, which could be made available in the author's own repository. The policy appeared to be silent about whether it was acceptable to self-deposit in one or more university and/or disciplinary repositories. (That is understandable, because the policy was established before repositories became a significant part of the landscape);

- copying of PrePrints, PostPrints and the Publisher's Copy was permitted, for "personal use, including classroom use", and for attendees at a meeting or conference at which it is presented. Commercial use required separate permission to be sought, and could require compensation;
- republication was permitted, although the only categories mentioned were "a printed compilation of [the author's] works, such as collected writings or lecture notes". That left open the question of republication in books.

NAS changed its policy again with effect from the beginning of 2009 ([NAS 2009](#)). Authors now retain copyright, and provide a licence to NAS. The effect of this was to further liberalise the terms, as follows:

- self-deposit of the author's own "manuscript" (i.e., in the terms used in this paper, the PostPrint) is now expressly permitted in any "preprint servers such as arXiv" and "in [the author's] funding body's archive or designated repository". This appears to deny self-deposit in other repositories (e.g. those of the employer and the author's discipline), unless specific funding was provided by them;
- republication for commercial purposes (phrased as a 'request from commercial companies') continues to require a formal request, and by implication NAS retains the rights to set fees and to veto republication. On the other hand, most authors would probably be very comfortable to depend on NAS to not let commercial considerations unreasonably override the benefits of republication.

The new NAS policy also referred to its 'author pays' option (currently US\$ 1,200 in addition to the base charge of \$70 per page). It also expressly stated that it had considered the Creative Commons licence (presumably the US version of the least liberal one recommended in [Clarke 2005a](#), [2005b](#)). It cited as the reasons for not adopting it, firstly the lack of clarity as to what 'commercial use' means, secondly the uncertain consequences of "unrestricted redistribution" and thirdly the lack of any means or even mechanism to "vindicate the author's rights if they have been violated".

(4) IP and Elsevier

The second case considered here is the world's largest journal-publisher, which has long earned massive profits from the business division. It might be anticipated by many casual observers that the conditions applied to authors would be among the least liberal of any publisher.

Elsevier's policy is published at Elsevier ([2008a](#), [2008b](#)). The company requires transfer of copyright, but it grants a relatively liberal licence back to the author. Much of the wording mirrors that used by NAS, suggesting a common source for some aspects of the policy. The comparison with the requirements identified earlier is essentially the same as that for NAS and presented in the immediately preceding section. The exceptions are as follows, with areas in which the policy may not satisfy the requirements highlighted by underlining:

- in relation to PrePrints, permission is granted to post "on Internet web sites including electronic pre-print servers, and to retain [them] indefinitely";
- in relation to the PostPrint, permission is granted (and according to the reference has been since May 2004) to self-deposit to "the author's personal or institutional web-site or server [subject to citation and linking to the Elsevier site]" (emphases added in this paper). Elsevier clarified (personal communication, 30 March 2009) that:

- 'institutional' means 'university', i.e. a PostPrint can be deposited to a university repository but a PostPrint cannot be deposited to a subject or disciplinary repository without prior permission from Elsevier;
- the 'or' is intended to be inclusive, i.e. and/or, i.e. either or both of a personal web-site and a university repository;
- the permission is not limited to a single university repository, i.e. a visiting professor with more than one university affiliation is permitted to place PostPrints in several university repositories;
- copying and republication for 'commercial purposes' is defined to include posting for use by customers of a company, associating advertising with the PrePrint, charging for distribution or access, and distributing to parties other than known colleagues, e.g. via email lists;
- PDFs of the published version of the paper may not be posted to public web-sites.

In short, the Elsevier licence terms conform to a very considerable extent with the requirements defined earlier in this paper, but falls short in the specific area of self-deposit of PostPrints in learned society repositories.

(5) IP and the Transportation Research Board (TRB)

The US has a National Research Council (NRC), which is jointly administered by the National Academy of Sciences (NAS, whose copyright policy was discussed in sub-section (3) above), the National Academy of Engineering, and the Institute of Medicine. The [Transportation Research Board \(TRB\)](#) is one of six major divisions of the NRC.

During the incubation period of this paper, TRB presented itself as an opportunistic case study within the learned society classification. The first-named author of this paper was a co-author of another paper, which was submitted to a TRB journal. Based on the TRB's formal statements and correspondence, its policies are less liberal than NAS in one key aspect (even though NAS actually provides publishing services to TRB). The explanation for this is that "TRB is a nonprofit educational institution, and these activities require funds. ... The purpose is ... to protect TRB's expenditures to make TRR Online possible. TRB is not making a profit from TRR Online; the goal is to make the service sustainable - that is, to break even" (all quotations from personal communication, 27 March 2009).

In comparison with the requirements of Unlocked IP identified earlier in this paper:

- copyright ownership in each collection satisfied the requirements;
- copyright ownership in each paper is transferred to TRB, and the conditions in relation to PostPrints fall short of the requirement, as highlighted by underlining below;
- in relation to PrePrints, "Any other versions of the TRR paper, before or after these versions submitted to TRB, can be published or posted as the author or copyright holder wills", and hence may be placed in, and remain in, the author's, institutions' and learned societies' repositories;
- the PostPrint is not permitted to be placed in any repositories. The same applies to the Publisher's Copy. They may, however, be "posted to a restricted-access website; or the abstract may be posted to a publicly accessible website, with a link to the TRB Publications Index". An exception is made where the source of funding mandates open access (which is common with research funding provided by US government agencies);
- the policy appears to be silent on copying, and hence to technically preclude it (although the practice might be more liberal than that);

- republication requires permission, but TRB's policy is "to approve promptly any request from an author to reprint or reuse material published by TRB ... [and] if that book or journal is then published openly on the web, TRB will not refuse permission".

This constitutes a 'yellow' policy in the terms used by SHERPA/RoMEO, i.e. it is reasonably liberal, but not 'green' (or 'Unlocked IP') as is the case with NAS and Elsevier. This more conservative position reflects concern that author self-deposit of PostPrints may threaten the publisher's business model, which is based on running at break-even based on subscription revenues.

4.2 Progress in the Adoption of OA

Broadly speaking, and with many specific qualifications at levels of detail, a great deal of progress has been made in 'Unlocking IP' in refereed journal papers. In a preponderance of cases, copyright arrangements permit at least PrePrints to be published in any repository/ies ('yellow'), and in many cases they permit self-deposit of the PostPrint as well ('green' / 'Unlocked IP'). Policies in relation to copying and republication also appear to be generally facilitative of ready access to research outputs.

Appropriate copyright licence terms are a precondition for open access and Unlocking IP. But the real test is whether papers are readily available. Indications of the current state of play in relation to the exploitation of liberalised copyright policies can be gained from several different tests.

(1) PostPrint Volumes

One measure of adoption is the proportion of articles that are being deposited into repositories. This includes both self-deposit and deposit on an author's behalf (e.g. through automated processes within a university, or by the journal-publisher). The repositories may be run by universities to reflect the output of their employees and associates, or by learned societies in a discipline or research domain (sometimes referred to as 'subject repositories'). Authors' own web-sites are commonly either ignored or deprecated in this literature.

Two recent studies of deposit-rates provide insight. Of Australian doctoral theses completed in 2005, only 12% were self-deposited into university repositories ([Sale 2006](#)). Meanwhile, a much wider study of the open availability of journal articles published in 2006 came up with an estimate of 11.3% ([Bjork et al. 2008](#)).

The deposit-rates vary enormously across universities, and across disciplines. Few universities have yet achieved high deposit-rates. In physics, a very high penetration-rate has been achieved by arXiv. In health-related disciplines, a high volume has been achieved by PubMed Central, run by the US National Institutes of Health (NIH); but NIH has had to resort to mandating self-deposit in order to lift its penetration-rate above 15%.

(2) ePrint Availability

A second indicator of the success of OA is the proportion of the accumulated literature that is available in open repositories. This was informally investigated by means of searches in [Google Scholar](#), in order to determine the extent to which copies of PrePrints or PostPrints

were openly accessible rather than all copies being locked up behind publishers' 'price and permission barriers'.

The work is laborious, and hence a small sample was used. Searches using author-names were avoided (because authors vary in their practices). Instead, several topic-areas with which the author had some familiarity were selected. The method used was to search Google Scholar for the term, and inspect each hit for which links were provided. Where the entry offered additional links (of the form "All 'n' versions"), these were also inspected. The locations in which the publications were available were classified according to the scheme reported below.

The first-named author had recently conducted citation analysis within the IS discipline, reported in [Clarke \(2008\)](#). Two previously-used terms were selected. One was a term of relatively long standing. The other was of more recent origin. The rationale for this was that a term of recent origin could reasonably be expected to only locate relatively recent publications, and a larger proportion of more recent publications, especially of paper-length rather than book-length, might be expected to be openly available.

The term of long standing that was selected was "information systems failure". The first 50 hits on Google Scholar were inspected (some of which were citations only, without any links, and were ignored). The outcomes were:

- 43 publications with a total of 2,432 citations (This ignores one publication from outside the discipline, and that appeared to be a spurious result in any case, which had 1,979 citations);
- 3 were unavailable in electronic form, including two major books (published in 1993 and 2002), with in all 454 citations, or 19% of the total;
- of the 40 articles, 7 were available from an open source and 33 were only behind barriers;
- the 7 open publications accounted for 571 citations, an average of 81 (but dominated by one publication with 380 citations, with the others averaging 32 each), and the 34 closed publications were responsible for the other 1,761 citations (averaging 52 each);
- of the 7 open publications:
 - 1 was open-only;
 - 6 were behind barriers but an open version was also visible;
- of the 7 occurrences of open publications (3 of which were available from two different categories of sources):
 - 0 were on authors' own web-sites;
 - 3 were in a single disciplinary repository (Citeseer);
 - 3 were in formal university repositories (at Brunel, Kingston and Loughborough, all in the U.K.);
 - 4 were in informal university repositories (on instructors' web-pages), in two cases more than one;
 - 0 were in OA journals.

The 7 open publications were published in 1995, 1998, 1999, 2000, 2001 and 2002. Publications in the topic-area were primarily during the 1990s and into the early 2000s, suggesting that the sub-sample distribution is not markedly different from the sample distribution as a whole.

The term of recent origin that was selected was "reintermediation". The date of the oldest publication appeared to be 1997. The outcomes were markedly different:

- 28 publications with a total of 733 citations;
- 14 were available from an open source and 14 were only behind barriers;
- the 14 open accounted for 485 citations and the 14 closed for 248 citations;
- of the 14 open:
 - 3 were open-only;
 - 11 were behind barriers but an open version was also visible;
- of the 18 occurrences of open publications (4 of which were available from two different categories of sources):
 - 8 were on authors' own web-sites;
 - 6 were in a single disciplinary repository (Citeseer);
 - 0 were in formal university repositories;
 - 3 were in informal university repositories (on instructors' web-pages);
 - 1 was in an OA journal.

The Association for Information Systems (AIS) operates an eLibrary that contains AIS journals and AIS and AIS-affiliated conference proceedings. The search-facilities are not yet of a professional standard, and it is not formally open, although a loginid is provided to members (for a membership fee of US\$125 p.a.). However even within that small catchment, the eLibrary finds and provides access to 43 papers that contain "reintermediation".

Any generalisations from a tiny convenience sample from a single discipline must of course be expressed extremely cautiously. The following very tentative inferences are drawn:

- there are signs of a moderate degree of openness for publications since the late 1990s, and probably at a level far greater than was the case prior to the mid-1990s;
- there is little evidence of retrospective capture of older publications;
- the impact of two forms of institutionalised OA (OA journals, and formal university repositories) may be less than another form of institutionalised OA (disciplinary repositories);
- at this stage, formal OA may be little more significant than informal OA (authors' own web-sites, and instructors making copies available on web-sites intended for their students, but not subject to any permission barriers).

(3) Journal Prices

A third measure of successful OA would be reductions in the prices of journal access, i.e. of subscription fees for individual journals, or for the bundles sold to libraries.

Some journal-publishers, in announcing the availability of 'author-pays' / hybrid journals, indicated that the subscription-price of journals would be reduced according to the number of OA articles that appear in the issues ([Suber 2006a](#)). To date, one report of a change of this nature has been seen: Oxford Journals claims that the online-only price increase for 2008 was only 1.7%, compared with the average increase for all journals of 6.9% (Richardson 2007). It may, however, take some time before it is apparent whether any widespread reductions will arise.

5. Conclusions

This paper has assessed the OA credentials of journals against an operational definition of the requirements, and found that the terms of copyright licences are much more liberal than was

once the case. The expectations of openness stimulated by widespread availability of the Internet, reinforced by the ePrints, OA and repositories movements, have to a considerable extent succeeded in creating the appropriate legal context for open access and Unlocked IP.

On the other hand, the exploitation of the opportunity has lagged, because of impediments to adoption, especially the lack of any positive incentive to self-deposit, and downright apathy. The outcomes to date are disappointing for proponents of OA and Unlocking IP. Only a small proportion of the literature is readily available, academics continue to be primarily dependent on the formal versions, academics continue to be uninformed and apathetic about self-deposit, and libraries continue to pay inflated prices to enable academics to gain access to the papers that they collectively wrote and that they collectively quality-assured. There are limited signs of the adoption process speeding up sufficiently to deliver significant results. OA and Unlocking IP in the area of journal articles are at serious risk of being still-born.

The nature of journals, and perhaps to some extent of papers, is in some flux. The possibility of de-construction into separates is one possible direction. Hybrid models are being experimented with, in endeavours to sustain cash flow in an open access context.

One example, the 'author pays' approach, can be seen as an attempt to diffuse the message conveyed by the OA movement, and sustain publishers' high charges and profitability by collecting equivalent revenue at a different point in the industry chain. A range of other possibilities exist ([Rowland 1999](#), [Clarke 2004](#)), including the [Berkeley Electronic Press \(bepress\)](#) notion of '[quasi-open access](#)'.

For-profit publishers might be seen as being under pressure to reduce their prices, and perhaps to enhance their value-add as well. Unless they can create new barriers to the open economy, the era of gross monopoly profits might be coming to an end, and the new forms that are emerging might offer the benefits of the digital era at much more reasonable cost ([Bergstrom & Lavaty 2007](#)).

That outcome is far from assured, however. If author self-deposit of PrePrints fails to become the norm, then access to papers will continue to be dependent on access to for-profit publishers' unduly expensive services. On the production side, many mutuels and learned societies may lack the commitment and sustained professionalism necessary to perform the publishing function. If so, enough of the new e-journals may be vacuumed up by for-profit publishers, enabling them to resume their highly-profitable business-as-usual. Given the limited evidence of any price-falls to date, perhaps they may even sustain their super-profitability in the interim.

A natural positioning step by for-profit publishers will be the offering to universities and learned societies of outsourced repository services. That will have the effect of denuding institutions of the technical capacity that they, and government research funding agencies, have invested in. But, faced with low adoption-rates and uncertainty as to whether the service is their 'core business' anyway, many may well give the business away gratis, under the assumption (probably mistaken, but at best valid only in the short term) that they will thereby reduce their costs.

The period 1995-2010 has seen considerable progress in establishing the preconditions for Unlocking IP in journal papers, and to some extent in journals as a whole. Whether those gains are permanent depends on ongoing commitment by universities and learned societies, and stimulation of a far higher level of adoption of self-deposit by authors.

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Web-Sites:

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