

A New Publishing Paradigm:

Returning Journal Proceeds to Scholarly Institutions

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The purpose of journals

Journals are the primary mechanism by which research is disseminated. They serve an essential role in organizing content by subject matter and quality. Through the peer-review process, a journal aims to publish research only of a quality above some approximate threshold level. Most journals have well-known reputations for their approximate threshold level. This serves two main purposes. One, it enables readers to examine material that is only above some approximate level of quality. This is essential in today's vast and interdisciplinary research environment, in which it is impossible to read every relevant article. Second, not only does the quality control serve scholars by directing them to the best sources of information to stay current or suggest new lines of research, but it also serves the academic profession as a mechanism for ranking researchers. Because researchers who perform higher-quality research tend to be published in more reputable journals, higher-quality researchers will tend to be more widely publicized and cited. This facilitates the measurement of academic performance and thereby helps to determine more efficient wages.

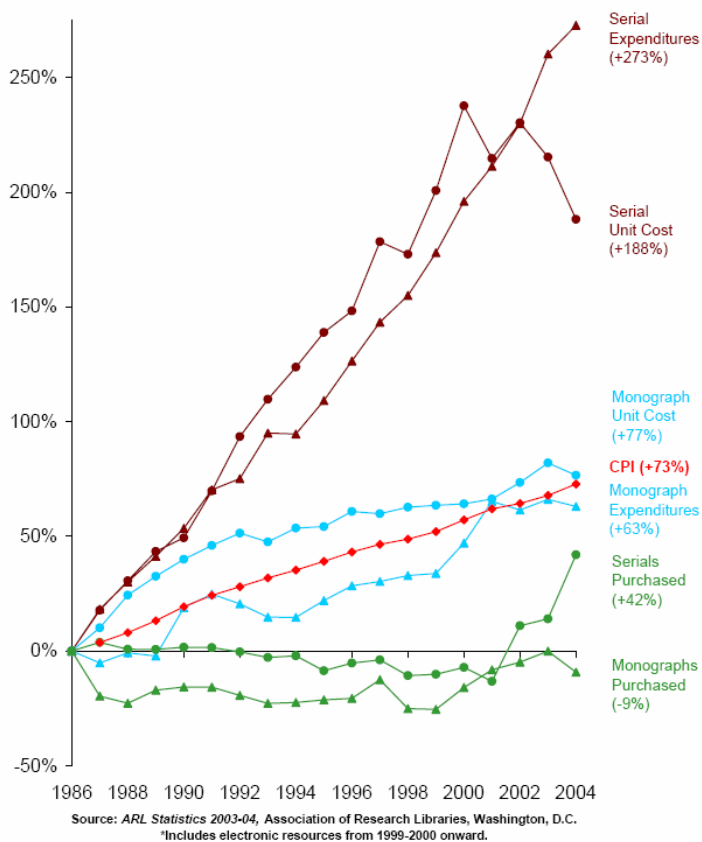
The problem

Reputation, being built up over time, cannot be easily substituted or altered. Thus a publisher who owns the right to the name of a journal has monopoly power over much of the reputation of that journal. Moreover, authors and institutions often grant exclusive copyrights to a journal that publishes their work¹. For-profit journal publishers are exploiting this monopoly

¹ Wiley is such an example. See <http://www.wiley.com/WileyCDA/Section/id-9020.html> (John Wiley & Sons, Inc., 2006).

power to extract immense profits from libraries², as libraries have been generally willing to pay the exorbitant prices they are charged for top journals. As prices continue to increase, however, universities are pressured to cut back on overall subscriptions—e.g., Cornell and Harvard have cut back their subscriptions from Elsevier (Hane, 2003). Nonetheless, total library subscription costs continue to grow (Cornell University Library, 2004), as libraries are compelled to purchase at least the most prestigious journals to adequately serve their patrons and maintain their own reputations. Moreover, the rise in prices is significantly greater than both inflation and the increase in prices of other research media such as monographs. These trends are presented in the following figure.

Monograph and Serial Expenditures
in ARL Libraries, 1986-2004*



² For example, Wiley, a major commercial journal publisher, has made well over 80 million dollars in net income each year for the last three years (<http://finance.yahoo.com/q/is?s=W-A&annual>) and in the last year had a 23.38% return on average equity (<http://finance.google.com/finance?cid=619520>).

This is an inefficient and perverse equilibrium. Researchers are the chief labor force of publishers. They usually work for free, as content providers, reviewers, and editors, and then their own institutions must pay the publishers for the fruits of their labor. On the other hand, non-profits are able to provide libraries with higher quality per unit of cost, as evidenced in the following table.

Journal Prices by Discipline and Publisher Type*

	Cost per Page		Cost per Citation	
	For-Profit	Non-profit	For-Profit	Non-Profit
Ecology	\$1.01	\$0.19	\$0.73	\$0.05
Economics	\$0.83	\$0.17	\$2.33	\$0.15
Atmosph. Sci	\$0.95	\$0.15	\$0.88	\$0.07
Mathematics	\$0.70	\$0.27	\$1.32	\$0.28
Neuroscience	\$0.89	\$0.10	\$0.23	\$0.04
Physics	\$0.63	\$0.19	\$0.38	\$.05

* From "The Costs and Benefits of Site Licences to Academic Journals", Proceedings of the National Academy of Sciences, Jan. 04, by C.T. Bergstrom and T.C. Bergstrom.

The difficulty of obtaining a solution

The difficulty of obtaining a solution stems from the for-profit publishers' monopoly position. Though the editors and peer reviewers are not beholden to work for commercial publishers, nor are societies or other content providers beholden to give up exclusive copyrights and marketing power to commercial publishers, seeking alternative arrangements has proved to be a serious coordination problem (Bergstrom, 2001). What is needed is either an increase in the bargaining power of libraries or a substitute product. As was evinced in the last section, a research institution has relatively little bargaining power because many of the journals marketed by commercial publishers are considered nearly essential to the institution's researchers.

The main difficulties of increasing bargaining power are (1) the supplier and customer bases are dispersed among many thousands of researchers and institutions and (2) collective action

risks antitrust violations (Bergstrom and McAfee, undated). While individual institutions can make a difference, the difficulty of coordination and the lack of substitutability from for-profits' journals make institutional action only part of an effective solution.

On the other hand, a substitute product, by definition, would allow libraries to replace commercial journals. The rest of this paper focuses on establishing an adequate substitute.

Substitute products and points of attack in for-profits' monopoly position

- Editors

In addition to the reputation residing in a journal's title, the reputation of a journal is largely held in the reputation of its editors. Journals created by defecting editors are often acknowledged as superior products to the journals from which the editors defect. The new journal keeps most of the reputation of the old journal. (See Appendix A for evidence.)

- Sponsoring societies

Potentially an even larger component of the reputation of a journal is a professional society's support. Much like editor defection, society defection can create a superior substitute product. A new journal will be an especially good substitute when formed by editors and societies who defect in tandem. (See Appendix A for evidence.)

- Journals themselves

Some of for-profits' journal offerings are not owned by a for-profit, but instead are marketed by a for-profit in exchange for a fee or proportion of sale revenues (Flagan, 5/30/06; McAfee, 4/25/06). Thus some journals themselves could be extracted from the control of commercial publishers.

The solution: IIJR

We propose that a new 501(c) non-profit organization be created to facilitate an attack on for-profit's monopoly power. We call this organization IIJR (Integrated International Journal

Repository). IIJR would offer low-cost on-line publishing and journal marketing. Though its offerings would be flexible to the needs of a particular journal, the core of the IIJR concept is on-line hosting of articles with pay-for-access per article or per journal, open access journals, individual journal websites with a uniform interface³, abstract and indexing, full-text search, other searching capabilities, and on-line peer review facilitation. IIJR would not bundle journals. Our pricing model would be similar to the current system offered by commercial publishers, in which there would be a fixed base price per journal and a variable price based on institution size. Outside of universities, individuals could pay per article or per journal. Individual and institutional rates for particular articles and journals would depend on licensing fees paid to the content provider; IIJR would negotiate such rates and fees with the content provider. IIJR would engender the creation of non-profit journals, both by offering its general services and, eventually, by actively starting journals as demand dictates. IIJR would also eventually provide one-stop shopping for non-profit content, vastly improving the complicated and often redundant publishing paradigm that currently prevails.

IIJR would also give content providers the option of maintaining print journals for existing subscribers. IIJR would contract out the job of printing and binding journals to printing presses.

Aside from the core features, as IIJR expands, IIJR's model is to become the premier on-line source of research materials. For example, another feature might be moderated discussion boards about research, including threads for articles of particular interest.

By offering content providers a superior alternative to commercial publishers, IIJR remedies the coordination problem of content providers seeking alternative arrangements. We will explore the intricacies and other virtues of IIJR throughout the rest of this paper.

Strategies for acquiring content

³ The design of the journal websites will have a uniform template with some aspects controlled by the society.

Since we cannot initially rely on name recognition to attract journals, we must strategically choose which journals to first target. We will now consider how well various categories of journals fit with IJJR's model. Later we will consider getting initial support for IJJR.

- Print-only journals

Targeting print-only journals presents an adverse selection problem. There is often a good reason why a journal is print-only. For example, some print-only journals publish large, high-quality copies of art or maps (McAfee, 4/25/06). Furthermore, print-only journals tend to have lower circulation rates. Because of the fixed costs of dealing with a content provider, this makes print-only journals relatively costly to deal with. Overall, they are relatively poor initial targets.

- Independent on-line journals

This is a promising source of content for IJJR. IJJR would reduce costs of hosting through economies of scales and offer better, more specialized marketing services than a society or group of professors could do for themselves.

- New journals

New journals would be good targets for the same reasons independent on-line journals would be good targets.

- Top journals who sell their content to for-profits for marketing

This is another promising source of content for IJJR and targeting such journals is one of the main components of our strategy to gain the support of libraries. The content and peer-review process of many of the commercial must-have journals are provided by non-profit societies. If IJJR can offer these non-profit societies a better or comparable value for their services, IJJR should be able to replace the for-profit publishers in the marketing role. Factors in IJJR's favor are the increasing recognition of the library problem, and some professors and

societies' willingness to go out of their way to support research, which IIJR promises to do. As we extract must-have journals from the for-profit publishers, we reduce the for-profit publishers' monopoly power, and will thereby push down prices.

IIJR should first conduct a marketing survey of societies with commercial publisher contracts. In this survey, IIJR would assess these societies' interests in IIJR, what they would like to see added or changed in the IIJR model, and when they would be able to join IIJR given current contractual obligations.

Extracting top journals can be accomplished as follows. First note that for-profits tend to bundle journals together (Hahn 2006). Assume that the societies are being paid $.8 * (\text{price of bundle}) / (\text{number of journals in bundle})$, which is a possible arrangement (McAfee, 4/25/06). The libraries value the lesser-quality journals in the bundle so little that some publishers offer the bundle at no extra-charge to ensure libraries purchase the bundle⁴. This is a marketing ploy to swindle the societies. When the lesser quality journals are owned by the for-profit, these journals' share of the library payment is not a cost to the for-profit; in fact, the costs of producing the lower-quality journals is so low that it can be profitable to give them away for free to reduce the payment to the societies who produce the higher-quality journals. Clearly both societies and libraries could benefit from a more efficient and equitable arrangement⁵. IIJR could provide such a substitute arrangement by, for example, adopting a slightly higher price than the average per-journal for-profit price, i.e. slightly higher than $(\text{price of bundle}) / (\text{number of journals in bundle})$. The libraries would still save money because the unbundling would lower the price per unit of value⁶ and reduce the for-profits' pricing power (Jeon and

⁴ For example, Wiley does this in its deals with Caltech (McAfee, 3/28/06).

⁵ For example, see Jeon and Menicucci, 2005 for the economic inefficiency of bundling.

⁶ There are many measures of value of a journal. For example, Caltech calculate its value by page views (Kimberly Douglas, head librarian, 04/06). Other measures are the number of citations in previous years and the impact factor, which is defined later.

Menicucci, 2005). And by returning 80% of the higher rate to the content providers, we can increase their revenues. Alternatively, offering a lower rate may also increase revenues due to the increased demand; moreover, societies may be willing to reduce their revenues to increase subscriptions.

We must also consider the response of the commercial publishers. Given for-profits' available cash, it is hard to say if IJJR can win a bidding war over journal content based on projected revenues for the content provider alone. However, a for-profit publisher is unlikely to enter a bidding war. For one, IJJR is non-profit and is thus (1) content to break even in working with a society and (2) has a significant tax advantage due to tax exemption. Moreover, IJJR can keep a proposed deal with a society open until it is accepted. Therefore, a for-profit cannot protect its future pricing power by temporarily transferring some of its profits to the societies we target, as IJJR's proposed deals would not go away. And as mentioned before, (1) IJJR's status as a non-profit organization dedicated to the dissemination of knowledge should have some compensating value to the societies, and (2) getting society support will be discussed in further detail later.

Implementing IJJR

A journal marketing firm like IJJR requires several elements—sales, information technology (IT), and management. We need personnel to negotiate contracts with customers and content providers. Just in the scientific, medical, and technical (STM) journal publishing arena, there are “some 2,000 research libraries [that] account for [a] large proportion of business” (Waltham 2002). We recommend using a nonnegotiable pricing formulae to be as efficient as possible. Assuming a sales representative can deal with an average of 5 libraries per week for 40 weeks a year and we wish to deal with 2,000 libraries in 5 years (the time horizon of a “long-term” publishing contract [Hahn, 2006]), then we need 2 sale representatives. It is also nice to have

multiple sales representatives to benchmark their sales performance against one other. We also need one account representative for customer service and an office manager for secretarial and possibly janitorial service. In terms of IT, we need at least one software developer to upkeep and improve the website, including compiling journal content. On this small scale, a volunteer board of directors or a volunteer management team could provide management. While personnel account for the majority of costs, we also have overhead expenses. The extent of these expenses depends on the exact implementation.

For example, assume that we wish to provide an online system similar to what *Theoretical Economics* offers. *Theoretical Economics* is based on a free open-source product called Open Journal Systems (OJS). OJS relies on PHP and SQL⁷. An economical way to implement this would be to use fully managed Linux-Apache-MySQL-PHP (LAMP) hosting. While most services are likely to be provided by volunteers and donations in the initial years, we calculate the prices we would expect to pay commercially, as a conservative estimate of costs. A complete breakdown of costs is provided in the following table.

	Unit Cost	Unit	Quantity	Extended Cost	Notes
Account Executive	61,682.00	Per pers per yr	1	61,682.00	Salary.com (United State Median)
Sales Representative III	74,261.00	Per pers per yr	2	148,522.00	Salary.com (United State Median)
Software Engineer III	76,615.00	Per pers per yr	1	76,615.00	Salary.com (United State Median)
Office Manager	51,507.00	Per pers per yr	1	51,507.00	Salary.com (United State Median)
Employee benefits	30,000.00	Per yr	1	30,000.00	
Travel	35,000.00	Per yr	1	35,000.00	\$200 per diem / \$500 per flight
Office space	18.00	Per SF per yr	1000	18,000.00	Cushman & Wakefield (MCI building, downtown LA)
Desktop computers	1,000.00	Each	2	2,000.00	
Laptop computers	2,000.00	Each	1	2,000.00	
Laser printer	899.00	Each	1	899.00	HP Laserjet 4250
Office supplies	1,000.00	Per yr	1	1,000.00	
Telephone/fax system	1,000.00	Each	1	1,000.00	
Telephone/internet service	75.95	Per month	12	911.40	Verizon Freedom for Business
Commercial insurance	5,000.00	Per yr	1	5,000.00	
Startup legal services	10,000.00	Each	1	10,000.00	
Legal	5,000.00	Per yr	1	5,000.00	
Web Hosting	399.00	Per server per month	12	4,788.00	Pair Networks (P4 3.0Ghz/512MB RAM/80GB HDD/600GB bandwidth)
Total				\$453,924.40	

⁷ Either MySQL or PostgreSQL

To scale up, we would need additional software engineers and web hosting. As an example of the economics of LAMP based web applications, Wikipedia runs 130 servers and serves 150 million hits a day on under \$1.3M a year⁸. Most of that money is for additional hardware to expand services. Though its costs for technical expertise is extraordinarily low due to its prestige, in the latest fiscal quarter, Wikipedia needed only four employees, two of which were part-time. Four additional full-time software engineers (III) at the median salary amount to an additional cost of \$297,044. If Wikipedia's employee costs were this amount, its costs would still be under \$1.5M. This gives a conservative estimate of the annual technical costs of implementing IIJR in the long run.

We would also need to increase our sales force and number of account executives. Furthermore, eventually IIJR would become a major publishing organization and would require full-time, professional management. For an organization as important as IIJR, management compensation would become a large part of costs. For example, in the last fiscal year, salary (including bonuses etc.) of the Sr. VP of STM at Wiley was \$784,000 and this employee earned another \$754,000 from exercised options (Yahoo!, <http://finance.yahoo.com/q/pr?s=JW-A>). We endorse paying competitive, performance-based compensation to IIJR's employees to compete effectively against commercial publishers. However, there is a compensating differential in working for non-profits that would lower compensation relative to for-profits. Provided we confirm this is legal for 501(c) non-profits, we could create similar compensation packages to those in publicly traded companies by tying compensation to revenue and profits, with possible caps on compensation amounts.

⁸ Calculated by multiplying the costs of the last fiscal quarter, from Wikimedia Foundation (<http://wikimediafoundation.org/wiki/Budget/2005>), by 4: 321,200*4=1,284,800. This does not take into account depreciation which would lower the expenses.

The extent of total costs will depend on how IIJR expands and the level of donated resources. However, IIJR is readily capable of covering costs. For example, consider targeting Wiley’s non-profit content providers with the highest impact factors⁹: *Hepatology* (10.416), *Journal of Pathology* (5.333), *Cancer* (4.434), *Liver Transplantation* (3.984), and *Journal of Biomedical Materials Research* (3.652, both parts A and B). By acquiring must-have journals as measured by impact factors, we supplant Wiley’s monopoly power in these subject areas. The total price of these journals using the average package prices is \$9,171.00 per year¹⁰. Suppose the following: (1) we acquire these journals’ content, with negotiating done by volunteers; (2) following the previous discussion of top journals in the section “Strategies for acquiring content,” we charge the average listed package prices, of which 80% goes to societies and 20% to IIJR; (3) following the above discussion on minimum scale of operations, IIJR operates on the minimum scale with the sales representatives closing ten deals a week for forty weeks, for a total of 400 deals per year, over 5 years, i.e. until there are 2,000 deals; (4) a deal sells all the journals (for a price of \$9,171.00); (5) a deal’s payment begins in the beginning of the following year; (6) a deal is paid into perpetuity at a constant price; (7) costs are constant. Then IIJR’s yearly profits and overall value, using the CAPM¹¹, are summarized below.

	Year 1	Year 2	Year 3	Year 4	Year 5	Into perpetuity
Costs (\$)	453,925	453,925	453,925	453,925	453,925	453,925
Revenues (\$)	0	733,680	1,467,360	2,201,040	2,934,720	3,668,400
Profits (\$)	-453,925	279,755	1,013,435	1,747,115	2,480,795	3,214,475

⁹ From JCR Science Edition (2004). John & Wiley Sons Inc. and Ltd. were both selected in publisher list. 2004 impact factor for a journal $X = (\text{number of citations in 2004 of } X \text{ articles from 2002-03}) / (\text{number of } X \text{ articles from 2002-03})$.

¹⁰ See link to “All Wiley Journals” on <http://www.wiley.com/WileyCDA/Section/id-103479.html> (John Wiley & Sons, Inc.). Note *Journal of Pathology* is not part of package so we simply use the list price as the “average package price”. Also the only journal for which the whole package is not included among the five journals is *Cancer*, whose package is only \$540 and contains only one other journal.

¹¹ The riskfree rate is taken to be the 10-yr US Treasury Bond yield from <http://finance.yahoo.com/bonds>, 5/17/06. The beta is taken to be the beta of Wiley (from <http://finance.google.com/finance?cid=619520>), 5/17/06. The expected return of the tangency portfolio is taken to be the 10-yr annualized arithmetic average return of the S&P 500 (from <http://finance.yahoo.com/q/hp?s=%5EGSPC>, using adjusted close prices, going back to 5/17/96), 5/17/06.

Riskfree rate	0.05
Beta	0.34
Expected market return	0.13
Risk-adjusted rate	0.08
Total value (\$)	31,848,253

Overall profitability of IIJR is an expected result and should hold in any realistic scenario, provided we have sufficient start-up funding. As discussed previously, commercial publishers have been enormously successful, and we plan to fill their shoes with a significant tax advantage. A for-profit's unique position is its monopoly power, not a superior business model. We can assume the for-profits' monopoly power and profits, share the proceeds more equitably, all the while increasing the economic efficiency of the publishing industry and research in general.

Again, funding sources for starting up are addressed in a later section.

Other responses to the library problem and their complementarity with IIJR

- As IIJR expands, it may directly facilitate editor and society defecting to start new journals.
 - IIJR would target journals which remain significantly overpriced.
- Open access models: articles are freely accessible over the web
 - Author-pay model: journals are supported by author submission fees; however, this is considered economically impractical for many content providers (Bergstrom et al. 2004). A compelling alternative is the author-pay model with authors' research institutions covering the submission fees. Universities should lead the way in instituting policies to cover author submission fees, at least up to some amount, to foster the growth of open access.
 - Open source publishing tools (e.g. <http://dpubs.org/> and <http://www.pkp.ubc.ca/>) to facilitate societies themselves running their journals.
 - PLoS (www.plos.org): this organization publishes high quality, peer-reviewed open

access on-line journals; besides being entirely open access, a fundamental difference from IJR is that it is involved in the management of the editorial/peer-review process, a role left to the content providers by IJR. Like IJR's model, PLoS prices near marginal cost; PLoS uses the author-pay model with additional support from advertisements.

- arXiv.org: arXiv is a subsidiary of Cornell University dedicated to the rapid spread of recent scientific developments in the fields of physics, mathematics, quantitative biology, non-linear science, and computer science. Each of the papers published on its website is immediately accessible to everyone once the author has had someone of proper authority in the field approve it. This approval process is nothing more than endorsing the paper, not critiquing its results or correctness. ArXiv.org is able to store these articles indefinitely for only \$1-\$5 per article¹². Because of experience and economies of scale, arXiv would be well suited to implement IJR. It is a non-profit organization, and its interface is simple enough to allow easy *expansion* into paid journals. While it may be possible to convince arXiv's board of directors to endorse IJR, because it is a subsidiary of Cornell University, revenues from arXiv could end up going to other items in Cornell's general budget, including administrative expenses, upkeep, research budgets, etc. This creates a conflict of interest that puts other libraries and research institutions at a significant disadvantage; Cornell could increase the prices of publishing the journals in order to increase its budget. Furthermore, other research institutions may suspect Cornell is increasing its budget, whether or not it is. Because we wish to minimize possible conflicts of interest within our organization, arXiv would not work as a base on which to start IJR unless Cornell were willing to allow arXiv to become a separate, unaffiliated non-profit organization.

¹² Based on the direct labor costs per year involved only in processing incoming submissions and operating an e-mail "help desk." (Hardware and labor costs for maintaining the static archival database add on only a small percentage.) "Creating a global knowledge network." (Ginsparg 2001).

For authors in the aforementioned fields who want to make their work immediately accessible to the greater scientific community, they can use arXiv to publish a non-peer-reviewed copy of their paper. Initially, IJR will not compete in this domain. Moreover, arXiv is not a replacement for the peer review system, as it has only weak means for quality control; instead it is a complement to dissemination, serving the demand for rapid distribution.

This complementarity might be strengthened through a partnership, offering one-stop shopping. The main concern is cannibalizing societies' profits by facilitating access to free preprints or copies. IJR might give a content provider the *option* of linking its content to arXiv's articles for users who do not have access to the journal article. As noted below, search engines could serve the purpose of simultaneously searching through IJR and arXiv.

Another consideration beyond the scope of this paper is incorporating additional fields into arXiv.

- Search engines: search engines can search through databases, institutional repositories, and individual professors' websites
 - Web of Science (ISI) and Google Scholar: both are search engines specifically designed to find scientific papers via either metadata or the original text; they would serve IJR best through licensing or donating their search capabilities to IJR. They should not implement or own part of IJR, because, as for-profits, they could take too much advantage of the system in the future as commercial publishers are doing with today's journals.
 - A search engine such as Google Scholar could serve the purpose of simultaneously searching multiple sources of scholarly information, such as both arXiv and IJR.
 - As with arXiv, search engines are complements to IJR.
- Pure archiving: storing articles previously published in another medium
 - JSTOR: by reducing the number of hard copies stored at various libraries around the

country, JSTOR represents the possibility of significant savings for libraries. JSTOR also has fairly extensive searching capabilities. However, if JSTOR started its own electronic publishing division it would be stuck in the awkward position of publishing journals that compete with commercial journals it wishes to archive.

As we wish to keep back issues of our publications on our website, we compete with JSTOR's archiving, and JSTOR may block IJJR's access to back issues of publications previously archived in JSTOR. Nonetheless, these factors are more significant for JSTOR than IJJR. JSTOR's utility is too limited in scope to be a necessary component of a long-term solution to the library problem. IJJR could do what JSTOR does, without the redundancy of publishing through various organizations.

- Other complementarities to IJJR
 - Though some of the above solutions compete with IJJR on some levels, competition is healthy.
 - Increasing appreciation of the library problem makes societies and universities more likely to support IJJR.
 - Similarly, surveys to help universities and societies assess their members' sentiment about IJJR would be a valuable complement.

Funding sources

We have shown that IJJR is capable of becoming self-sustainable after its initial implementation is funded. This section addresses the problem of funds for starting-up and the early years before subscriptions become enough to sustain IJJR.

The following funding sources should be considered.

- Non-corporate foundations
 - Example: Association of Research Libraries (ARL)

- Corporate charity
 - Money or in-kind contributions
- Advertising
- Sponsorship
 - The idea of a sponsorship is giving no more than a few sources of financial support special recognition as *the* sponsors of IIJR; relative to normal advertising, this links the image of IIJR much more tightly with the image of the financial contributor
 - Sponsorship could come from corporations, non-corporate foundations, universities, or individuals
- Institutional donations
 - For example, money, technical expertise, and server hosting
- Government grants
 - Consult [Grants.gov](http://www.Grants.gov)
 - Example: Electronic Records Project,
<http://www.archives.gov/nhprc/announcement/electronic.html>
- Individual donations
 - Fundraising
 - Voluntary donations on the website

Any of these sources could be valuable. We recommend first pursuing donations from sources other than corporations, with the exception of in-kind contributions. Advertising or corporate sponsorship creates an impression of a lack of objectiveness in the content that is chosen to be published on the IIJR website. Advertising also makes the website slightly less user-friendly, since most people would prefer not to see advertisements. Since IIJR would be representing the

research profession's interests and selling services to libraries, university support would be potentially the most valuable.

Strategies for getting initial support

Eventually it will become apparent that IJR is an effective publishing paradigm. But to get started, as already discussed, we need start-up donations, and we also need initial support. This section presents strategies for initially getting support from universities, societies, and other journal-content providers.

To obtain their interest, the solution should be presented to societies and libraries from their particular organization's perspective. Using previously presented material, it should be shown to a particular organization how IJR will improve the dissemination of research in general, and for that organization in particular; and how IJR will save the organization money. Universities must be convinced that IJR is an efficient long-term solution with a high probability of success to get them to donate substantial amounts of money. Societies must be convinced that our site is good enough to cancel and forego any exclusive marketing agreements and to undertake the administrative costs of dealing with us. Furthermore, societies should be willing to accept lower fees if they are more thoroughly convinced of our future success, which can in turn accelerate adoption.

In a presentation of IJR, the presenters should demonstrate the main features of the website. The site should include a history page which includes information about the donors, perhaps listing the trustees of the donor universities and the names of early journal content providers with lists of editors' and societies' names. Having gained the interest of the audience, the presenter could offer a low-risk contingent donation. For example, a presenter might ask a university to donate \$100,000 contingent on (1) \$900,000 or more similarly contingent donations and (2) getting contingent journal content over a certain threshold level of citations. The contingent journal content would be contracts employing IJR to market the content, in which the

contract is activated if and only if the levels, set above, of contingent funding and contingent content are reached. This reduces IJR's risk as well, since IJR would be required to service a contract only if IJR has a threshold level of resources. These contracts would have to specify by what year the contingent resources would need to be reached and when the service agreements would begin. The efficacy of our plan and the low-risk nature of these donations should ensure an effective start-up, giving IJR the momentum needed to reach self-sustaining status, at which point IJR can rely on quality to attract users and content. The initial site design and networking with libraries and content-providers can be supported by volunteers, grants, and local donations.

IJR in Action: HighWire Press (<http://highwire.stanford.edu/>)

We have thus far discussed this solution as if it needed to be implemented. Such an approach allowed us to delve into the intricacies of running a non-profit organization, and will now serve us in understanding HighWire Press, which essentially does what we have proposed. HighWire Press is an on-line publishing non-profit organization that allows content providers to set their pricing and licensing policies (Douglas, 5/28/06). HighWire offers a variety of customized solutions at varying costs. HighWire includes open access journals, and on-line manuscript submission and peer review tools. As in IJR's model, HighWire began by targeting top societies, with the acquisition of *Journal of Biological Chemistry* in 1995, the most highly cited and second largest peer-reviewed journal. Now, in May 2006, HighWire publishes 943 on-line journals, with 73 of the 200 most-frequently-cited journals, and is still growing. As IJR's model would predict given the commercial bundling regime, the most cited content providers have been the most attracted to HighWire. However, HighWire does not seem to coordinate journal printing services. This is a feature that if added could significantly increase the value of its services to content providers. (General information, unless otherwise cited, from HighWire, 2006.)

In contrast to our concerns, HighWire claims its affiliation with an existing university (Stanford) has been instrumental to its vision and success. According to HighWire, Stanford provides the desire and know-how to communicate research effectively, including lowering journal costs for research institutions and taking advantage of the latest computing technology.

Despite HighWire's success, it is an open question as to why HighWire has not been able to completely supplant commercial publishers over its eleven-year run. Content providers have proven to be ineffective when it comes to coordinating their interests, as alluded to in the section "The difficulty of a solution," so it may be HighWire has not been active enough in seeking journals. The experience of *Aerosol Science and Technology* provides evidence for such a claim, as when the owning society put the journal up for bid, HighWire did not make any offers (Flagan, 5/30/06).

Moreover, the demise of commercially owned journals may be inevitably slow, as even when editors and societies defect, commercial publishers can and have replaced the editors (as documented in Appendix A).

It may also be that HighWire is inefficient or is in fact siphoning revenues off to Stanford's budget, even if for developing new computing solutions or research into the journal market. It is the impression of the head librarian at Caltech that HighWire charges journals its costs of hosting them, unlike the revenue sharing scheme we envisioned (Douglas, 5/28/06). Yet they charge some open access journals prohibitive fees, as with an annual fee of \$30,000 for *Theoretical Economics* (McAfee, 5/29/06). If this was the average fee for all of HighWire's 943 journals, which would seem to be a lower bound given that *Theoretical Economics* was seeking a low-cost solution, this would amount to revenues of over 28 million dollars. If HighWire paid each of its 110 employees an average of 80 thousand dollars and paid the upper bound of the yearly technical web hosting costs calculated in the section "Implementing IJR," this would amount to costs under 11 million

dollars. This leaves over 17 million dollars unaccounted for. It is unclear with all the open source publishing tools available and HighWire's existing proprietary technology, how HighWire is using its revenues, if not to simply fund Stanford's budget. Such a large possible conflict of interest, we reiterate, is unacceptable if HighWire is to be the publishing paradigm of the future. If HighWire is entrusted with complete monopoly power, it must be bound to no other interests except those of the research community as a whole.

We conclude by noting that though IJR has the potential to be a complete solution, HighWire demonstrates the difficulty of successfully taking over the entire journal market. We recommend the following: (1) HighWire should sever its ties with Stanford or implement a strict underwriting policy prohibiting (i) any future transfer of revenues from HighWire to Stanford except for fair market value of services rendered and (ii) any deals whose terms are not available to the general public, (2) publish a declaration of purpose explicitly disavowing any special obligation to Stanford, (3) publish annually a breakdown of its revenues and costs as an independent entity, (4) increase its publicity and more actively seek new journals by contacting editors and society leaders, (5) seek to lower its costs to content providers, and (6) coordinate journal printing services for content providers.

Appendix A: Examples of societies and editors' influence

In 2000, the American Association of Physical Anthropologists (AAPA) announced its new publishing agreement with Wiley for the American Journal of Physical Anthropology. "Under the terms of the agreement, Wiley will reduce the institutional subscription rate from US\$2085/year to \$1390 per year; implement a second institutional subscription at 20 percent of the full rate (\$278); initiate a special rate for lapsed or new non-member subscribers; and enhance support [of] the AAPA Editorial Office over the seven- year period of the agreement." The chairman of AAPA cited the threat of starting a new journal was the most important component of their bargaining position. (Buckholtz, 2000.)

"The editor and editorial board of *Evolutionary Ecology*, after repeated unsuccessful efforts to get their publisher, Kluwer, to reduce its prices, resigned and founded a new journal, *Evolutionary Ecology Research*, whose first issue 18 appeared in 1999.... In 1998, the old journal, *Evolutionary Ecology* published about 1000 pages at an institutional price of \$800. The new journal, *Evolutionary Ecology Research*, publishes about 1000 pages per year at an institutional price of \$305 per year, with an electronic subscription included. The editor reports that *EER* made a slight loss in 1999 and a slight profit in 2000. In 1999, Kluwer's old journal, *Evolutionary Ecology* was able to publish only 600 pages. Kluwer reduced the price of the 2000 volume to \$467. Even at this price, the Kluwer journal seems to be no bargain, since as of March, 2001, not a single issue of the year 2000 volume has yet appeared.

"In November 1999, after unsuccessful negotiations with Elsevier Press over the price of library subscriptions, the entire editorial board of the *Journal of Logic Programming* resigned and started a new journal *Theory and Practice of Logic Programming*, published by Cambridge University Press. The sponsoring professional organization, Association of Logic Programming withdrew its support for the *JLP* and adopted the *TPLP* as their sole official journal. At the time of

this decision, the Elsevier journal was priced at \$973 for about 1100 pages. The new journal, which will appear in 2001 is priced at \$301 for approximately the same number of pages. In response, Elsevier changed the name of [its] journal to *Journal of Logic and Algebraic Programming* and reduced its price to \$701.” (Bergstrom, 2001.)

See Suber, 2006 for many other examples, some much more recent.

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