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The Librarians' Dilemma

Contemplating the Costs of the "Big Deal"

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(This Opinion piece presents the opinions of the author. It does not necessarily reflect the views of D-Lib Magazine, its publisher, the Corporation for National Research Initiatives, or its sponsor.)

Remember when Alice tumbled down the rabbit hole? Her world turned upside down: she shrank in size and then grew enormously; she received advice from a caterpillar; she collided with a mad hatter and took part in a mad tea party. Finally, just before she awoke, she found herself on trial, with everything at stake, and at last spoke her mind.

I feel a little bit like Alice these days. But instead of falling down the rabbit hole, we librarians have stumbled upon the Big Deal, and it's our responsibility to speak up before *our* world -- characterized by service to scholars, researchers, and other library users -- turns upside down.

So What's the Big Deal?

Simply put, the Big Deal is an online aggregation of journals that publishers offer as a one-price, one size fits all package. In the Big Deal, libraries agree to buy electronic access to all of a commercial publisher's journals for a price based on current payments to that publisher, plus some increment. Under the terms of the contract, annual price increases are capped for a number of years.

The Big Deal usually allows the library to cancel paper subscriptions at some savings or purchase additional paper copies at discounted prices. But the content is, henceforth, "bundled" so that individual journal subscriptions can no longer be cancelled in their electronic format. (The Academic Press IDEAL® program and the full ScienceDirect® package offered by Elsevier are examples of such licensing agreements.[1] However, I will refer to such agreements as the "Big Deal" rather than by their product names.)

Academic library directors should not sign on to the Big Deal or any comprehensive licensing agreements with commercial publishers.

You read that right. Don't buy the Big Deal. The University of Wisconsin Libraries and dozens of other research libraries also are holding out, convinced that the Big Deal serves only the Big Publishers. Many other university and college libraries are also investigating their options, recognizing -- as we all do -- that the push to build an all-electronic collection can't be undertaken at the risk of: (1) weakening that collection with journals we neither need nor want, and (2) increasing our dependence on publishers who have already shown their determination to monopolize the information marketplace.

Alternatives to the Big Deal abound. We can continue the print subscriptions that our institutions can afford. We can license electronic access to only those titles that are most needed by our users -- most research libraries subscribe to less than half the Elsevier titles in paper format. We could also provide free document delivery (fast interlibrary loan from commercial information vendors when necessary) of any article needed by our users as an alternative to the Big Deal.

My library has licensed about 120 Elsevier titles for e-access and subscribes to approximately 600 in paper. By doing so, we have avoided the principal hazard of the Big Deal: It bundles the strongest with the weakest publisher titles, the essential with the non-essential. Once you have tumbled for the Big Deal, the library cannot continue to receive the titles it most needs unless it continues to subscribe to the full package.

A Dangerous Game

There's no question that the Big Deal offers desirable short-term benefits, including expanded information access for the library's licensed users. In the longer run, these contracts will weaken the power of librarians and consumers to influence scholarly communication systems in the future. Librarians will lose the opportunity to shape the content or quality of journal literature through the selection process. Those who follow us will face the all-or-nothing choice of paying whatever publishers want or giving up an indispensable resource. The largest publishers will not only have greater market power to dictate prices. They will also have more control over contractual terms and conditions -- including the ability to "disintermediate" other players in the economic chain.

The current generation of library directors is engaged in a dangerous "game" in which short-term institutional benefits are achieved at the long-term expense of the academic community.

Now I turn to a different mathematician than Lewis Carroll: Albert W. Tucker, who created "The Prisoners' Dilemma" way back in 1950. (The title of this paper is a respectful reference to "The Prisoners' Dilemma" which is the most famous example of game theory.)[2] Briefly: the significance of game theory in the social sciences was decisively established in 1994 with the award of a Nobel Prize to John Harsanyi, the University of California, Berkeley, John Nash, Princeton University, and Reinhard Selten, Bonn University, for their analysis of non-cooperative games -- of which the "Prisoners' Dilemma" is the premier example.[3] Game theory has been attracting the interest of scholars for a long time. It has since spawned a vast literature, in print and now on the Internet. The scenario of the game is as follows:

Two criminals are arrested for committing the same crime and are held separately by the police. Each is told that if he remains silent, he will nonetheless be prosecuted for a lesser crime on the basis of the available evidence. But if one testifies against the other providing indisputable evidence of the other's guilt, then the betraying partner will go free while the other pays the full penalty. Typically, the three possible outcomes of the game are mathematically expressed such that if both remain silent, there is a small benefit, and if both betray one another, there is a lesser penalty. However, the biggest payoff and penalties occur when one partner remains silent and the other defects.

Prisoners' Dilemma

		Prisoner A	
		Cooperation	Defect
Prisoner B	Coop	A + 5 B + 5	A + 10 B - 10
	Defect	A - 10 B + 10	A 0 B 0

The "remarkable result" of "The Prisoners' Dilemma," to quote the economist Roger McCain [5], is that "individually rational action results in both persons being made worse off in terms of their own self-interested purposes." The game is a vivid illustration of the nearly overwhelming temptation to pursue private ends in transactions where community interests are at stake. The structure of the game is such that -- unless one changes "rules" to tilt the play in favor of cooperation -- the pressure to defect is irresistible.

Social scientists were quick to recognize that "The Prisoners Dilemma" had certain parallels in the real issues confronting society. Indeed, arms control negotiations and price setting by business competitors (to name only two examples) *closely* resembled the dynamics of "The Prisoners' Dilemma." The model revealed the paradox that cooperation can be irrational while, at the same time, lack of cooperation has very substantial risks.

Game theorists were able to calculate these risks, showing that some methods of playing the game over successive trials are more successful than others. They found, for example, that "tit for tat" (I'll cooperate with you if you cooperate with me) is a comparatively effective strategy for playing "The Prisoners' Dilemma."

Biologists used this "iterated" version of "The Prisoners' Dilemma" -- in which the interactions are repeated again and again -- as a model for understanding the development of cooperation among animals. That is, animals seem to learn "altruism" by repeated exchanges in which cooperation results in benefit over time. It appears that animals recognize and remember when the benefits of cooperation exceed the cost of contributing.

One of the strongest criticisms of "The Prisoners' Dilemma" is that it is obviously too simple to represent complicated social and economic relationships. But, interestingly, the complexities of large and subtle situations can also be expressed mathematically and placed into a game theory model.[4]

The Scholarly Communications Game

Is game theory relevant to the crisis of scholarly communication? Are we confronting the "librarians' dilemma?" As with other complex social and economic problems, game theory offers powerful insights without giving us a solution. This is so often the case with mathematicians. They have a long history of constructing interesting questions and then leaving it to future generations to find the answer.

The first thing that can be observed is that -- just like the players in "The Prisoners' Dilemma" -- librarians and publishers are behaving "rationally." Certainly it makes sense for publishers to bundle products for electronic sales and access. It allows for more efficient marketing, integrates related content, and offers the prospect of controlling future production costs.

Product bundling -- aggregating journal content in a single electronic resource -- is a useful strategy for smaller non-profit publishers, too. Some non-profit aggregations, like BioOne, have been created for the specific purpose of offering an alternative for smaller academic journals to go digital without having to go commercial.

The Big Deal is tempting to small libraries because it provides the kind of journal access that they've always wanted at a relatively low initial cost. The largest libraries like it because they are spared the pain of further subscription cuts, and they are restored to the glory days of "comprehensive collecting." Those who have purchased the Big Deal tell us that everyone is happy. Students are happy, faculty members are happy, even university administrators are happy. Certainly, the commercial publishers are very happy with this arrangement.

Prisoners' Dilemma

		Prisoner A	
		Cooperation	Defect
Prisoner B	Coop	win win	**WIN** **LOSE**
	Defect	**LOSE** **WIN**	lose lose

However, the analysis of the Prisoners' Dilemma shows that we are not playing a simple "win-win game," as it is so often characterized. The matrix of possible outcomes is both more complex and more risky. It looks something like the Prisoners' Dilemma table shown above. In the interest of space I will limit my criticism of the Big Deal to three general points that, in my judgment, flow out of game theory analysis. I have entitled them "Enhanced Loyalty," "Disintermediation," and "Changing the Rules."

(1) Enhanced Loyalty

There is no loyalty like enhanced loyalty, and nothing enhances customer loyalty quite like *indispensability*. The 1999 Reed Elsevier Annual Report [9 and 10] makes reference to both indispensability and enhanced customer loyalty in the section on strategic initiatives. There is nothing sinister about the way these terms are used in the Report. After all, many things can enhance loyalty including good service and mutual trust.

However, as we have noted, libraries that buy the Big Deal are obliged to be loyal customers because they can't cancel individual subscriptions. All they can do is cancel the subscription to the paper copy and, under the terms of the license, continue to pay for electronic access to the original journal.

Out of necessity, subscribers to the Big Deal are more loyal than authors, who may submit articles to a competing journal, or the editors, who may quit and form another journal. Even if an editorial board revolts and creates a low-cost competing journal, the library must continue to subscribe to the abandoned title. This has actually happened with the journal *Theory and Practice of Logic Programming*.[5] The authors and editors switched their allegiance from Elsevier to Cambridge University Press, but the Big Deal subscribers will have to remain loyal to the old journal.

In order to find an example of fully enhanced loyalty, we need look no further than Nexis-Lexis. We librarians know from experience that Nexis-Lexis has both added and deleted content from their database at their discretion. Because libraries have purchased the database and not its parts, *selection* -- as we librarians use the term -- is a meaningless concept. Our bargaining position has been weakened in direct proportion to the indispensability of Nexis-Lexis.

Could we really choose not to subscribe to Nexis-Lexis on the grounds that the content has changed or because next year's price increase is too high? The answer, I believe, is that Nexis-Lexis is so large, so heavily used, so popular -- in a word, so *indispensable* -- that our customer loyalty is the same as my devotion to my utility company during a Wisconsin winter.

The main difference, of course, is that academic contracts for Nexis-Lexis are cheap compared to the price of commercial journals. In fact, commercial journals in digital or print format remain unreasonably and unnecessarily expensive, and will become more so under the terms of the Big Deal.[6] Cost studies repeatedly have shown these journals to be three to four times as costly, on average, as society journals are. An annual price increase of seven percent will double the cost of the Big Deal licenses over the period of a decade.

This is not a "win-win" situation. Once our loyalty well and truly has been enhanced to the point where the Big Deal is indispensable, the result is a WIN-LOSE.

(2) Disintermediation

The Big Deal will give the largest commercial publishers extraordinary power to control terms and conditions of the information market. For example, if librarians choose to mitigate the cost increases of the Big Deal by doing away with print subscriptions, they will discover that the publisher may require that the library deal with the publisher directly and sever its business relationship with the serials vendor for those publications. The serials vendors will be *disintermediated*.

One could argue that this is just the efficiency of the new economy in action. However, it is efficient only if the Big Deal publisher performs the services of the serial vendor (and I assure non-librarians reading this paper that these services are considerable). If, on the other hand, these processes and services must now be absorbed by the library, then disintermediation is a major cost transfer to libraries. And it is a hidden price increase for subscribers to the Big Deal.

Here's another quick example of disintermediation. The contract for the Big Deal expressly forbids libraries to use the electronic content for document delivery to outside clients. For example, Wisconsin TechSearch,[7] the document delivery service of UW-Madison's Wendt Engineering Library, may not use the ScienceDirect database to provide information to businesses. It does not matter that Wendt Library is willing to pay a royalty for each use of an article. It doesn't matter that many of these articles were written by our faculty members. The Big Deal prohibits such use of the content. In this case, our libraries will be disintermediated.

Information transfer to the citizens, businesses, and public institutions of my state has been the mission of my university for more than a hundred years. It is also a specific mission of every land grant university library. Commercial publishers cannot and will never satisfactorily perform that service. This outcome of the Big Deal is another WIN-LOSE that undermines research literature as a public resource for economic and social progress.

(3) Changing the Rules

Exhorting people to do the right thing has limited effectiveness in dealing with complex problems of cooperation. It just doesn't work very well to implore *me* to take the bus so that *we* can have less traffic congestion.

However, game theory demonstrates that changing the conditions and strategies of play can and does alter outcomes. If the rules, rewards and penalties are changed, the behavior of the players will change dramatically -- you can count on it. We need to follow a similar strategy. In our context, this means that we must support changes in the academic rewards system and invest in new emerging systems of scholarly communication.

Change has been slow in coming but, remarkably, leaders who are intent upon changing the scholarly communication system are now coming forward within the community of researchers. This was not true ten years ago.

I will cite just one idealistic example called the "Public Library of Science" [8]. The leaders of this advocacy group include Harold Varmus, former director of the National Institutes of Health, and Mary Case, Director of the Association of Research Libraries' Office of Scholarly Communication. They are circulating an "open letter" which calls for nothing less than: "the establishment of an online public library that would provide the full contents of the public record of research and scholarly discourse in medicine and the life sciences in a freely accessible, fully searchable, interlinked form."

Scientists are invited to express their support by "signing" this open letter online. We could say, of course, that they are only dreaming. That goal will not be achieved any time soon. But as of March 9, 2001, there were more than 9600 signatories affiliated with an impressive list of institutions.

Standing on Solid Ground

The most important thing that librarians can do to change the rules of the game is to invest in bold new experiments in scholarly communication; by which experiments I mean The Scholarly Publishing and Academic Resources Coalition (SPARC) partners such as MIT CogNet, BioOne, Columbia Earthscape, New Journal of Physics, Project Euclid, and others.

In investing in these new forms of scholarly communication, we are steadily building the publishing infrastructure so that future scholars may never have to publish in an expensive commercial journal in order to be academically successful. Despite the fact that we are spending a small percentage of our budgets compared to the Big Deals, these initiatives are profoundly subversive to the commercial publishing system -- and the commercial publishers know it.

Such new initiatives are especially important at a time when there are encouraging signs that some of the most over-priced commercial journals are dying -- not just being marginalized by their small subscription numbers, but actually ceasing to publish. Some of you may have noticed the quiet celebration in the library community as the news spread of the possible demise of the Gordon & Breach journal *Particle Accelerators*.

At the same time we are witnessing the success of new start-up ventures like Michael Rosenzweig's journal *Evolutionary Ecology Research*[8], which is another SPARC partner journal. Here we have a brand new non-profit academic journal that has reached the break-even point in just three volumes and is now publishing quality research articles for twenty-five cents per page (one-tenth the unit cost of many commercial publications).

Finally, we should continue to rely on those economic models of scholarly communication where trust is warranted on the basis of our experience. One of the most valuable lessons of the last decade is that partnerships have worked for us. We should be reluctant to give up those business relationships with publishers and vendors who are committed to quality service and the academic enterprise. Perhaps this is another paradox. We cannot create new rules unless we maintain and nurture our old alliances. Once we do that, there will be no chance of our tumbling down the rabbit hole; we'll be on solid ground at last.

Notes

[Note 1] I conducted a simple survey to determine the market penetration of these two products at a recent talk attended by many research librarians. Of 27 responses 66% had licensed the Academic Press IDEAL program and 60% had licensed ScienceDirect.

[Note 2] I must credit John Wiley, the Chancellor of the University of Wisconsin-Madison, for introducing me to the Prisoners' Dilemma and the relevance of mathematical game theory to decision-making in real situations. Chancellor Wiley talks about mathematics in much the same way that he talks about music. To him, they are both beautiful.

[Note 3] (See <http://william-king.www.drexel.edu/top/prin/txt/Imch/dilemma.html>.)

[Note 4] *The Tragedy of the Commons* [3] is non-cooperative game that may better represent the complexities of social problems like traffic congestion, resource management, and, perhaps, scholarly communication.

[Note 5] *Theory and Practice of Logic Programming* <http://www.cwi.nl/projects/alp/TPLP/tplp.html>.

[Note 6] Despite the fact that the Big Deal has been in place for years at several major universities there are no published studies that measure the cost per use of the journals aggregated in these licenses. The cost effectiveness data we have are based on cost per unit of content and cost per use of print resources.

[Note 7] Wisconsin TechSearch, <http://www.wisc.edu/wendt/wts/index.html>.

[Note 8] *Evolutionary Ecology Research*, <http://www.evolutionary-ecology.com>.

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[6] Poundstone, William. *Prisoners' Dilemma*. New York: Doubleday, 1992.

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[8] Public Library of Science (website) <http://www.publiclibraryofscience.org>.

[9] Reed Elsevier Annual Report for 1999. Report of the Chairman & the Chief Executive Officer, "Vision & strategy for growth." <http://194.202.202.208/investors/accounts/1999/annual/b1_chair_t3.asp>.

[10] Reed Elsevier Annual Report for 1999. Business Review, "Scientific: review and strategic initiatives." <http://194.202.202.208/investors/accounts/1999/annual/b1_busrev_t1.asp>.

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