



purchasing a particular product through a consortium. These would include knowledge of the pricing for comparable databases, knowledge of the pricing for the same database delivered through another vendor, and even knowledge of the pricing for the very same product licensed for an individual library. Libraries can—and should—consider as much information of this sort as is feasible in order to make an informed decision on whether to subscribe to a product through a particular consortial arrangement.

Another factor that libraries consider in consortial purchases (but one that is rather difficult to quantify) is whether the allocation of costs within the consortium is fair. There is some sense, but perhaps only a theoretical one, in which each of the methods for the dividing of costs described above can be said to be fair because they are all based on formulae that are systematically applied.

Some of the factors that one would consider in describing the notion of fairness in apportioning costs within a consortium are self-evident, including:

- **Simplicity and clarity:** All participants can understand the method of apportioning costs and are not left with

the suspicion that they are being disadvantaged by a complex formula they do not understand.

- **Equity and impartiality:** All participants feel that they and (perhaps more important) all other participants are paying their fair share of the costs.¹³

Important as they are, these ideas are not sufficient for defining the notion of fairness in a consortial purchase. It must be noted that it is possible for each of the three methods for dividing costs discussed above to generate an allocated cost for an individual library that is higher than the cost would be for that library to subscribe that product without the consortium. This is particularly true of the two simplest methods for dividing costs. Institutions at the extremes, specifically large institutions when dividing costs by FTE and small institutions when dividing costs equally, are most susceptible to this problem. The situation in which one institution is asked to incur additional costs for the sake of the consortium, of course, can destroy the fabric that holds the consortium together. Many consortia recognize this fact and explicitly adopt operating principles that prevent such a situation from developing.¹⁴ One can

conclude, then, that the costs that individual libraries would incur if purchasing independently ought to be accounted for in determining a fair allocation of costs within a consortium.

Because individual libraries are likely to consider their potential costs for a given resource from both the individual and consortial point of view, perhaps this should be factored into the notion of what makes for a fair allocation of costs within the consortium itself. This can be done by taking into account how the participants in the consortial license share in the *savings* achieved by the consortium. It could be argued, in fact, that a consortium's failure to consider the cost savings realized through the consortial arrangement and the effective distribution of those savings among its members can lead to the perception that the allocation of costs in the consortium is unfair. In many ways, fairness is essentially a perception of the participants.¹⁵ This being the case, because all, or at least many, of

the foregoing methods of allocating costs can be said to be equitable and impartial, it may be that the only meaningful *measure* of fairness is the equitable distribution of cost savings among participants.

Proportionally Distributed Savings

In some cases, in addition to the cost for a particular product for the consortium, the individual costs for that product for every institution in the consortium are also known. This would be the case, for example, if the vendor's pricing scheme is published. When individual institutions' costs are known, it is a relatively simple calculation to apply the consortial discount equally to each institution in the consortium.

The allocated cost for each institution in table 3 is calculated by determining the percentage discount from the total list price for the discounted consortial price (the Total under Allocated Cost) and then applying that discount to the list price

TABLE 3
Equal Percentage Savings Per Institution

	FTE	%/FTE	List Price	Allocated Cost	%/Cost	Savings	%/ Savings
Consortium A							
Institution 1	6,000	24.00%	4,095.00	3,631.02	23.43%	463.98	11.33%
Institution 2	5,500	22.00%	3,795.00	3,365.01	21.72%	429.99	11.33%
Institution 3	5,000	20.00%	3,495.00	3,099.00	20.00%	396.00	11.33%
Institution 4	4,500	18.00%	3,195.00	2,832.99	18.28%	362.01	11.33%
Institution 5	4,000	16.00%	2,895.00	2,566.98	16.57%	328.02	11.33%
TOTAL	25,000	100.00%	17,475.00	15,495.00	100.00%	1,980.00	11.33%
Consortium B							
Institution 6	15,000	44.78%	9,495.00	8,378.94	42.43%	1,116.06	11.75%
Institution 7	10,000	29.85%	6,495.00	5,731.57	29.03%	763.43	11.75%
Institution 8	5,000	14.93%	3,495.00	3,084.19	15.62%	410.81	11.75%
Institution 9	2,500	7.46%	1,995.00	1,760.50	8.92%	234.50	11.75%
Institution 10	1,000	2.98%	895.00	789.80	4.00%	105.20	11.75%
TOTAL	33,500	100.00%	22,375.00	19,745.00	100.00%	2,630.00	11.75%
The prices in this table, list price (for all institutions) and the discounted consortial price (the Total under Allocated Cost), are derived from the formula used by Encyclopaedia Britannica for its product, Britannica Online.							

for each separate institution. As a result, the percentage of savings experienced by each institution in the consortium is identical to that of all the others. Note that the total dollar savings increases for the larger institutions because their proportion of the savings is applied against a larger list price. The slight differences for each institution in table 3 between the percentage of FTE and the percentage of cost can be attributed to the tiered formula used for determining the list price.

Vendors' pricing schemes, such as the one used in this example, frequently give progressive discounts to larger institutions. Thus, a consortium might legitimately give consideration to whether it should, in fact, make it a goal to distribute savings equally. A legitimate point of view would be that this is actually favoring the larger institutions by giving them a disproportionately larger discount because their initial list price (or quoted price) is already more heavily discounted. But a decision *not* to distribute consortial savings proportionally may lead to a situation that violates the principle that no institution should be asked to pay a consortial price for a particular product that exceeds its cost for purchasing it without the consortium.

Approximated Proportional Savings by Institution

Some vendors may decline to provide individual pricing for every institution in a consortium. The vendor's rationale for offering discounts to consortia, in fact, may be based on avoiding the overhead of generating numerous, single-institution quotes. But to have some basis on which to make a calculation for the distribution of the savings experienced by the consortium, at least some pricing for individual institutions in the consortium must be known. If a vendor can be persuaded to produce individual quotes for *selected* institutions in the consortium, it is possible to deduce approximately the extent to which the vendor is basing its pricing on institutional size. By compar-

ing quotes for institutions that, at a minimum, represent the larger and smaller in the consortium, the distribution of costs can be interpolated for the remainder of the institutions in order to distribute the savings in a way that approximates a proportional distribution.

Table 4 illustrates the situation in which the list prices for only the largest, smallest, and midsized institutions are known. The allocated cost for each institution is calculated based on a combination of equal division by institution and proportional division by institutional FTE student enrollment. But instead of using an arbitrary distribution between equal division and proportional division, the distribution is optimized to produce the smallest differences, calculated as the standard deviation, in the percentage savings of the institutions for which a list price is known. Several things should be noted about this table. First, the distribution between equal division and proportional division differs between the two hypothetical consortia, 14.16 percent/85.84 percent for Consortium A and 6.07 percent/93.93 percent for Consortium B.¹⁶ Second, there is some amount of variation in the percentage of savings experienced by the institutions in the consortia. Consortium A in the example can achieve a very similar percentage of savings across the consortium, but Consortium B cannot. The percentage of savings that the institutions in Consortium B experience ranges from 10.01 to 18.61 percent. But all other possibilities of distribution between equal division and proportional division result in even greater disparities. Of course, this is the result of the use of this technique to *approximate* a proportional distribution of savings to the institutions in the consortium in a situation where only some of the list prices for individual institutions are known.

This illustration assumes that nothing is known about how the vendor's pricing scheme is structured. In some cases, it may be possible to refine the strategy to produce better results. For example, if the vendor uses a tiered pricing scheme,

TABLE 4
Approximated Proportional Savings by Institution

	FTE	%/FTE	List Price	Equal Division	Proportional by FTE	Allocated Cost	%/Cost	Savings	%/Savings	Standard Deviation
Consortium A										
Institution 1	6,000	24.00%	4,095.00	438.82	3,192.22	3,631.04	23.43%	463.96	11.330%	
Institution 2	5,500	22.00%	3,795.00	438.82	2,926.20	3,365.02	21.72%	429.98	11.330%	
Institution 3	5,000	20.00%	3,495.00	438.82	2,660.18	3,099.00	20.00%	396.00	11.330%	
Institution 4	4,500	18.00%	3,195.00	438.82	2,394.16	2,832.98	18.28%	362.02	11.331%	
Institution 5	4,000	16.00%	2,895.00	438.82	2,128.14	2,566.96	16.57%	328.04	11.331%	
TOTAL	25,000	100.00%	17,475.00	2,194.10	13,300.90	15,495.00	100.00%	1,980.00	11.330%	0.000006
				14.16%	85.84%					
Consortium B										
Institution 6	15,000	44.78%	9,495.00	239.70	8,304.40	8,544.10	43.27%	950.90	10.015%	
Institution 7	10,000	29.85%	6,495.00	239.70	5,536.27	5,775.97	29.25%	719.03	11.071%	
Institution 8	5,000	14.93%	3,495.00	239.70	2,768.13	3,007.83	15.23%	487.17	13.939%	
Institution 9	2,500	7.46%	1,995.00	239.70	1,384.07	1,623.77	8.23%	371.23	18.608%	
Institution 10	1,000	2.98%	895.00	239.70	553.63	793.33	4.02%	101.67	11.360%	
TOTAL	33,500	100.00%	22,375.00	1,198.50	18,546.50	19,745.00	100.00%	2,630.00	11.754%	0.019942
				6.07%	93.93%					

The figures enclosed in boxes represent figures that are imagined not to be known for the purposes of this illustration. They are excluded from the calculations that determine the distribution of costs within the respective consortia but are shown here so that the reasonableness of the technique can be assessed. Most important, the figures in the double-lined boxes are excluded from the calculation of the standard deviation.

The prices in this table, list price (for all institutions) and the discounted consortial price (the Total under Allocated Cost), are derived from the formula used by Encyclopaedia Britannica for its product, Britannica Online.

it would be best to select institutions near the middle of their respective categories for sample pricing by the vendor in order to produce the most effective cost allocation across the consortium.

The Bid Method

Possibly one of the more innovative methods consortia have used to determine how costs for a consortial license will be borne by the participants is one that allows participating libraries to use a bidding process to determine (within limits) what they will pay for a particular resource. Inspired, perhaps, by the popularity of the online auctions such as that of the Web site eBay, this method lets libraries bid as a way to indicate the amount they are willing to pay for a given resource licensed through the consortium. The process described below is used by the Network of Alabama Academic Libraries (NAAL).¹⁷

After an announcement is distributed to consortium members soliciting expressions of interest in a particular resource and their responses are collated, an initial quote is requested from the vendor. Then a cost analysis is produced and distributed to the group. This analysis illustrates an equal division by institution, a proportional division by FTE, and a 50/50 combination of equal division and proportional by FTE, the consortium's preferred method. The group of potential participants is asked to respond by indicating an amount they are willing to pay to establish the license. If the participants have bid enough to match the quoted amount, the consortium proceeds on those terms. However, if the group has collectively bid too little to begin the license, the institutional bid amounts are distributed to the group as a whole with a comparison to the consortium's preferred method of cost allocation, and the group participants are asked to resubmit their bids. This re-bid process may continue until a solution is found. An institution whose bid is judged to be too low may ultimately be dropped in order to put

together a workable license according to NAAL's practices, although in some cases licenses have been initiated with some institutions clearly subsidizing others in order to provide for greater access. In any case, other consortia may choose to adopt their own principles of operation in this regard. If an institution is removed from the process, or if a library voluntarily drops out at this stage, the resource will have to be requoted and the bid process resumed.

For NAAL, the goal in a license established this way is ultimately to move the division of costs toward the formula of a 50/50 combination of equal division and proportional by FTE. In subsequent renewals of the license, for example, if the consortium faces a price increase from the vendor, those paying less than the amount calculated by the preferred method are the first asked to increase their payments.

The principal value of this technique is that it allows a consortium to initiate a license for a resource in the face of unplanned for—and possibly unknown—potential costs. As the consortial license for the resource becomes established, participating institutions can incorporate the necessary funds into their budget planning.

Apportioning Costs Based on Usage

Most of the methods for allocating costs for consortial purchases discussed above rely on a measure relating to the size of the library or its parent institution. An alternative measure that can be brought into service for determining an allocation of costs, and that would appear to be quite promising, is the relative amount of usage of the licensed product by the participating members of the consortium. Basing a cost allocation on usage would certainly appear to pass the test of fairness in that it would be both simple and impartial.

One drawback to this method, though, is that it is not usable at the beginning of a subscription, there being no usage statistics on which to base an allocation of cost.

This leads some consortia to consider the adoption of this method beginning in year two of the subscription.¹⁸ It must be noted that this problem also applies whenever a new institution joins the consortium. Because this method of allocation of costs is applicable only after the subscription has been in place long enough for usage statistics to be available, some other method would have to be adopted in the subscription's first year.

There is another effect of the absence of usage data at the beginning of a subscription. When an institution knows that it will be required to pay for a product in year two based on its usage of the product in year one, it may fear a significant increase in its allocated cost at that time that would force the abrupt cancellation of the resource. So if a usage-based allocation is seen as desirable for a consortium, it may be necessary to phase in this approach over several subscription years. This could be done by first making two alternative allocations, one using usage statistics and the other using one of the foregoing methods of allocating costs,

and then gradually shifting the weighting from the latter to the former.

Vendors offer a variety of usage statistics on which consortia can base their allocation strategies. Those probably of most use for this purpose would be the number of search sessions, the number of searches conducted, and the number of full-text documents retrieved or printed. Consortia may choose a combination of these statistical measures in calculating their cost allocations or may use a single measure.

Table 5 illustrates the situation with two hypothetical consortia allocating their costs among participants based on a single measure: the number of searches conducted at the respective institutions in the course of the previous year. The calculation initially determines the percentage of the aggregate searches within the consortia attributed to each institution and then distributes the cost for the subscription among the participants by that percentage.

The search statistics used in table 5 are extrapolated from actual statistics of

TABLE 5
Resource Usage by Institution

	FTE	%/FTE	Searches	%/ Searches	Allocated Cost	%/Cost
Consortium A						
Institution 1	6,000	24.00%	225,956	27.42%	2,742.15	27.42%
Institution 2	5,500	22.00%	47,835	5.81%	580.51	5.81%
Institution 3	5,000	20.00%	401,079	48.67%	4,867.40	48.67%
Institution 4	4,500	18.00%	58,440	7.09%	709.21	7.09%
Institution 5	4,000	16.00%	90,701	11.01%	1,100.73	11.01%
TOTAL	25,000	100.00%	824,011	100.00%	10,000.00	100.00%
Consortium B						
Institution 6	15,000	44.78%	412,483	46.42%	4,641.81	46.42%
Institution 7	10,000	29.85%	283,286	31.88%	3,187.91	31.88%
Institution 8	5,000	14.93%	107,701	12.12%	1,212.00	12.12%
Institution 9	2,500	7.46%	29,041	3.27%	326.81	3.27%
Institution 10	1,000	2.98%	56,114	6.31%	631.47	6.31%
TOTAL	33,500	100.00%	888,625	100.00%	10,000.00	100.00%

a real consortium to illustrate the reality of variation that might exist among different institutions. Although the number of searches generally tracks with the size of the institutions, there are some significant anomalies. Noteworthy, for example, is the fact that search statistics for Institution 3 and Institution 8 differ by a factor of four, even though the hypothetical institutions are the same size. In addition, Institution 10 has almost twice as many searches as Institution 9, even though its FTE student enrollment is only 40 percent of the larger institution. Consortia considering allocating their costs based on usage should expect such variability among their participants.

Another potential negative for using usage data in determining cost allocation, and one that has led some consortia explicitly to reject this approach, is that it appears to penalize libraries that have more active instructional programs, engaged faculty who assign library research, and the like. In other words, libraries are disadvantaged when they are more effective in carrying out their mission.¹⁹ In fact, one could argue that an allocation of costs based on usage results in an economic incentive *not* to conduct an effective program supporting the use of consorcially licensed products. It would be a tragedy indeed if libraries willingly entered into agreements that influenced them negatively in this way. Conversely, it could be argued that this is just the cost of doing business and that, as all consortium participants strive to be more effective, these costs will even out.

A final caveat must be mentioned regarding an allocation of costs based on usage. Like several of the other methods

for allocating costs, a usage-based formula has the potential for generating an allocation that would require a library to pay more for the resource through the consortium than it would by purchasing it alone. Arnold Hirshon suggests that this can be remedied by setting a maximum amount of usage an individual library would be assessed.²⁰

A usage-based method of allocating costs may be of particular value for consortia with disparate memberships, and especially so for multitype consortia, because it is based on a measure that has an identical meaning for all participating institutions regardless of size or type. Moreover, this method relates the cost of a product for a specific institution directly to the value it gets from the product. Small institutions with research-oriented curricula will likely pay a much higher rate per user using this method because of their higher level of usage.²¹ However, because high-usage institutions are receiving a greater value for their investment, it could be argued that allocating them a higher portion of the costs would be appropriate.

Conclusion

Academic library consortia have several options when facing decisions on how to allocate costs for their group purchases of electronic products. Each of the various formulae presented here might be appropriate for use in specific situations, although some may be problematic. Consortia should be very sensitive to issues of fairness in the cost-allocation methods they adopt and should take care to implement formulae that are clearly understandable and equitable to all participants.

Notes

1. Reason Baathuli Nfila and Kwasi Darko-Ampem, "Developments in Academic Library Consortia from the 1960s through to 2000: A Review of the Literature," *Library Management* 23, no. 4/5 (2002): 209.

2. Barbara Allen and Arnold Hirshon referred to this approach as characterizing a federation more than a consortium and questioned the ability of such an organization to achieve results beyond the most basic. See Barbara McFadden Allen and Arnold Hirshon, "Hanging Together to Avoid Hanging Separately: Opportunities for Academic Libraries and Consortia," *Information*

Technology and Libraries 17, no. 1 (Mar. 1998): 38.

3. Anthony W. Ferguson, "Consortia mania," *Against the Grain* 9 (Apr. 1997): 86.
4. Norman Oder, "Consortia Hit Critical Mass," *Library Journal* 125, no. 2 (Feb. 1, 2000): 50.
5. Andrew Odlyzko, "Competition and Cooperation: Libraries and Publishers in the Transition to Electronic Scholarly Journals" in *The Transition from Paper: Where Are We Going and How Will We Get There?* ed. R. Stephen Berry and Anne Simon Moffat (Cambridge, Mass.: American Academy of Arts and Sciences, 2001). Available online at <http://www.amacad.org/publications/trans13.aspx>. [Accessed 14 January 2005].
6. Lindsay Harris and Mary Peterson, "Sharing the Burden: A Model for Consortium Purchasing for Health Libraries," *Journal of the Medical Library Association* 91, no. 3 (July 2003): 362.
7. These statistical measures are recommended by ICOLC to support consortial licenses for electronic resources. See International Coalition of Library Consortia, "Guidelines for Statistical Measures of Usage of Web-based Information Resources (Update: December 2001)." Available online at <http://www.library.yale.edu/consortia/2001webstats.htm>. [Accessed 25 November 2004].
8. Tom Sanville, quoted in Ron Feemster, "When Libraries Faced the Future," *University Business* 3, no. 1 (Feb. 2000): 27.
9. James R. Dwyer, "Consortial Review and Purchase of Networked Resources: The California State University Experience," *Bottom Line* 12, no. 1 (1999): 10.
10. Indiana University, "Full-time Equivalent Enrollment," *Indiana University Fact Book 2004–2005*. Available online at <http://factbook.indiana.edu/fbook04/enroll/fte.shtml>. [Accessed 17 January 2005].
11. Common Data Set Initiative, "Common Data Set 2004–05." Available online at http://www.commondataset.org/cds_200405_v2.pdf. [Accessed 17 January 2005].
12. For a listing of a number of consortia and the factors they take into account when allocating costs, see Bernie Sloan, "Allocating Costs in a Consortial Environment: A Methodology for Library Consortia," *OCLC Systems and Services* 15, no. 1 (1999): 35–52. Sloan details cost sharing in a number of different types of consortia, including some that are sharing costs for joint operations, such as shared library management systems or document and materials delivery systems, as well as costs for shared licenses for electronic products.
13. Some of these ideas are derived from Harris and Peterson, "Sharing the Burden," 362–63.
14. ORBIS has done so, for example. "The guiding principles, that all participating libraries should benefit and that no library should pay more than it would by purchasing individually, have meant that allocation formulas have varied from service to service." See Sue A. Burkholder, "ORBIS: Grassroots Academic Partnership," *OLA Quarterly* 5, no. 1 (winter 1999). Available online at <http://www.olaweb.org/quarterly/quar4-4/burkholder.shtml>. [Accessed 2 November 2004].
15. Arnold Hirshon, "Library Consortium Funding and E-resource Cost-sharing: Goals, Options, and Best Practices." Available online at <http://www.gela.org/ge/eifl/files/present/Arnold%20Hirshon-paper.doc>. [Accessed 14 January 2005].
16. An ancillary observation about this is relevant to the discussion of the technique illustrated in table 3: consortia that arbitrarily select a 50/50 distribution between equal division and proportional division are likely to be using a formula that is biased toward their larger institutions. It is probably the case that a greater share of the savings is being passed on to the larger institutions than to the smaller ones.
17. Sue Medina, director, Network of Alabama Academic Libraries, in discussion with the author, December 13, 2004.
18. Harvey R. Brenneise, "First Steps in Developing a Statewide Digital Health Library in Michigan," *Proceedings of the Victorian Association for Library Automation Conference, E-Volving Information Futures, Melbourne, Australia, February 6–8, 2002* 1 (2002). Available online at <http://www.vala.org.au/vala2002/2002pdf/13Brneise.pdf>. [Accessed 17 January 2005].
19. Medina, discussion with the author.
20. Hirshon, "Library Consortium Funding and E-resource Cost-sharing."
21. This was the case in the South Australian Human Services Libraries Consortium, which felt that this approach addressed a problem with more specialized databases in which certain larger institutions were seen to be subsidizing the smaller ones that made intensive use of these resources. See Lindsay Harris and Mary Peterson, "Sharing the Burden: A Model for Consortium Purchasing for Health Libraries," *Journal of the Medical Library Association* 91, no. 3 (July 2003): 362–63.