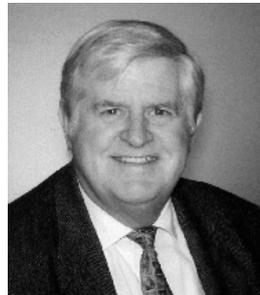# Measuring value and return on investment of academic libraries

Updated from a paper presented by Carol Tenopir at the 33rd UKSG Conference, Edinburgh, April 2010

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The value of an academic library to its parent institution is difficult, but important, to measure. Many different methods have been used to measure value, including return on investment (ROI), contingent valuation, and other explicit and implicit measures. In a recent study we looked at the value and ROI of the library e-journal collections in the grants process in eight universities in eight countries. The results show that library-provided access to scholarly journals supports faculty productivity and that faculty members value and use electronic resources to support their research, grant and publishing activities.

Introduction

The problem of how to determine the value of a library's services and products is not a new one. Many scholars throughout the years have attempted to take an abstract concept, such as the value of information, and make it more concrete and measurable.[1,2,3,4,5,6,7] What was once often an intellectual exercise, however, now has practical urgency for librarians and for the institutions they serve. This is due both to an uncertain economic climate and to rapid advancements in information technology that call into question the traditional roles of the library, while providing opportunities for new roles. Libraries must demonstrate their value in measurable ways that are meaningful to funders and administrators. Just as importantly, measuring the value of services and products helps librarians make decisions about which best serve their users and provide the best return to both the institution and its constituents.

Value in context

The first problem in the process of determining the value of a library is a basic one: What constitutes value and how do you measure it? Various

approaches to demonstrating the library's value have been developed. The economist Machlup[8] identified information as having value in two main aspects: 1) purchase/exchange value (i.e., what one is willing to pay in money or time for information) and 2) use value (positive results of using the information). Tenopir and King[9] outline two broad categories of value measures, particularly as those measures relate to readings: implicit measures (implied by answers to other questions, like amount of reading or use) and explicit measures (which directly describe purchase or use values, such as the amount of money or time spent in obtaining readings).

In 1997, Saracevic and Kantor[10] attempted to establish a theoretical framework for the study of library value, examining philosophical and economic definitions of value, and making a deceptively simple, but quite important point: "Value is and must be considered in some context. In relation to information and information services the context of use is highly important." As Matthews[11] points out, while librarians "are primarily concerned about providing access to resources and information … [t]he library's funding decision makers … want to ensure that the library is … meeting the needs of the community of users" within the context of the parent institution's mission and goals. A comprehensive review of the literature on the value of academic libraries by Oakleaf[12] echoes this, warning that: "Internal, service quality, and satisfaction measures are of great utility to librarians who seek to manage library services and resources, but they may not resonate with institutional leaders as well as outcomes-based approaches." Her review defined ten areas of library value "within the context of an institutional mission and/or outcomes: student enrollment, student retention and graduation, student success, student achievement, student learning, student experience, faculty research productivity, faculty grants, faculty teaching, and institutional reputation".[13]

Ultimately, what is valuable to the individual and to the university as a whole is that which contributes to the mission of the institution, and that mission is the starting point for libraries in defining the context for measuring value. For most institutions, their mission includes an emphasis on research, scholarship, innovation, creation, and student success. Many also include goals such as contributing to the economic and cultural development of the communities they serve. These goals constitute the broader context in which libraries function, but in order to assess the contribution of the library, concrete measures of how the library contributes to these goals must be defined.

In a review of studies on the economic value of libraries, Missingham[14] found that there are three basic 'waves' of library value studies in recent years. The first wave of studies looked at library value in terms of efficiency. These studies were largely internal examinations of how to make the existing services and processes of the library more cost effective. The second wave began to look at the contribution of libraries in terms of attempting to assign a dollar value for the services provided.[15,16] These studies culminated in the third wave of studies that is still ongoing. Several of these studies use return on investment and other methods to quantitatively assess outputs and impacts.

Value of e-journals

Many studies have made clear the significant contributions that academic library journal collections make to institutional goals. Surveys from 2004 to 2007 of academics in the United States, Finland and Australia revealed that in the United States and Finland, faculty who published more also read more.[17] A recent study in the UK points in a similar direction: universities with more downloads of electronic articles had higher faculty publication rates.[18] A study at five US universities showed that faculty who publish more or who have won awards read more articles on average than their less productive colleagues.[19] Larger library budgets also appear to be correlated with greater faculty productivity. Jones[20] found that among the top 50 liberal arts colleges in the United States (as rated by the 2004 US News and World Report), those schools which ranked higher had substantially larger library expenditures. Budd[21] similarly found a positive correlation between higher faculty publishing rates and larger library budgets in the top 20 ARL institutions. Students also benefit from the library: research by Mezick[22] suggested that higher academic library expenditures and professional staff had a significantly positive effect on student retention. Many studies have indicated that electronic resources accessed

through the library or library consortia are considered the most important sources for e-readings by academics.[23,24,25,26,27,28,29,30,31] Other studies have used multiple methods to focus on the value of library electronic collections, with both faculty and students benefitting from the convenience and efficiency of e-access.[32,33,34,35,36, 37, 38]

Contingent valuation involves estimating the cost in money or time of not having a service, compared to the monetary or time cost involved in having that same service. Return on investment (ROI) balances the investment the parent institution or other stakeholders make in the library with the monetary returns attributed to the library's products and services. For example, King, Aerni, Brody, Herbison and Knapp[39] evaluated the cost in time and money for faculty to acquire an information resource if the source for their last reading were not available through the library. The cost to the university of making readings available through the library was $3.43 million, while the cost of alternatives was estimated to be $13.48 million. This yielded a net benefit of $10.05 million, an ROI of 2.9 to 1.

In 2004, the British Library commissioned a study to examine the value of the library to UK citizens, calculating ROI using contingent valuation. They found that for every £1 of public funding invested in the library there was an ROI of about 4.4:1.[40] Many similar studies have looked at the ROI to their communities from public libraries, finding ROI rates from 4:1 to over 10:1.[41,42,43,44,45]

Academic library value to grants: ROI

While some studies using ROI and contingent valuation have been done in corporate and special libraries[46,47], when researchers at the University of Illinois at Urbana-Champaign (UIUC) determined a need to start applying the concept of ROI to universities, they found 'no ready-made formulas or templates' and that the strategies that worked for public libraries did not readily apply to academic libraries.[48] In the end, a model developed for use in corporate libraries was adapted at UIUC to measure one small component of value, that of the library's contribution to the grants process. Using library budget data, data on grant income and proposals, surveys, and interviews, the team found that the library played an important role in providing citations used in the grants process,

including grant proposals, final reports and publications. This case study found an ROI to the university in grant monies awarded of 4.38:1, using the total library budget.[49]

In order to test the viability of this model, a second study tested the formula developed at UIUC in eight universities in eight countries, including institutions in Asia, North America, Europe, Africa and Oceania. The ROI findings in this second study for the grant process ranged between 0.64:1 and 15.54:1.[50] The wide range in ROI can be attributed to differences in the primary focus and mission of each institution and is a good illustration of the point that no one formula can be universally applied without adjustments. Since libraries tend to be unique, a workable transferable model must be flexible and customizable.

Academic library value to grants: surveys

Seven of the eight institutions agreed to survey their faculty about their use of scholarly articles in their grant proposals, reports and publications. In 2008, faculty members (academic staff) were sent an e-mail from the library director at each respective institution. The e-mail invited them to participate in a survey and contained an embedded link to the web-based survey instrument, housed on the University of Tennessee server.

The response rate ranged from 8.4% to 32.9% at each individual institution, with an overall response rate of 22% (n=2857.) Due to the requirements of the IRB human subjects permission, respondents were allowed to skip any question; therefore the number of respondents to each question varied.

The survey was delivered in four languages, with the majority of responses in English (70.4%), followed by Japanese (20.8%), Spanish (4.9%) and French (3.9%). Over half (53%) of respondents reported they were the principal investigator (PI) or Co-PI on at least one externally funded grant in 2007. For the same year, 64% were grant active, meaning they submitted a grant proposal and/or were PI or Co-PI on an externally funded grant.

Analysis

Prior research has linked faculty productivity with both higher rates of reading and usage of library-provided electronic resources. The current study

indicates that most faculty members recognize the importance of using citations in all aspects of the grants process. When asked: *"Based on your understanding of the awards process for external research grants, how important is it to include references to journal articles and/or books in grant proposals?"* a majority of all faculty members at the seven institutions responded that citations are essential, very important, or important to grant proposals (90.4%). This number includes both those who had been active in the grants process in the previous year and those who had not (Table 1).

Respondents were also asked: *"On average, how many references to articles and/or books do you cite in each of the following: grant proposal, final grant report, [and] article for publication?"* Although almost all respondents report they use citations, there are some differences between those who had been grant active in the previous year and those who had not. Grant-active individuals report they typically include significantly more citations in a typical grant proposal than those who had not been grant active in the preceding year (Table 2).

Similarly, grant-active respondents report citing significantly more in a final grant report than do grant non-active individuals (Table 3). The differences are even more striking when citing articles for publication (Table 4).

A majority of all faculty members report they access at least some of the articles they read and cite from the library's electronic collection, but again there are some significant differences between those who were grant active in the previous year and those who were not. Fifty-seven percent of grant-active individuals accessed three-quarters or more of articles electronically from the library/institutional system, compared with only 41% of those who were not grant active (Figure 1).

Faculty members read many articles for each one they cite. Both grant-active and grant non-active individuals report reading on average about 24 articles for each one they cite. Just counting citations thus grossly underestimates usage and value. In addition to citing more on average, grant-active individuals are more likely to read more articles for each one they cite (Table 5).

	essential	very important	important	somewhat important	not important	Total
Grant non-active	276 43.5%	164 25.9%	122 19.2%	47 7.4%	25 3.9%	634 100%
Grant active	677 54.6%	267 21.5%	190 15.3%	90 7.3%	17 1.4%	1241 100%
Total	953 50.8%	431 23.0%	312 16.6%	137 7.3%	42 2.2%	1875 100%

Table 1. *Importance of citations in grant proposals (n=1875, p = .000)*

	0	1–9	10–19	20–29	30+	Total
Grant non-active	173 34.1%	93 18.3%	92 18.1%	71 14%	78 15.4%	507 100%
Grant active	35 3%	212 18%	284 24%	228 19%	425 36%	1184 100%
Total	208 12%	305 18%	376 22%	299 18%	503 30%	1691 100%

Table 2. *Number of references cited in a grant proposal (n=1691, p = .000)*

	0	1–9	10–19	20–29	30+	Total
Grant non-active	192 39.3%	59 12.1%	83 16.9%	66 13.5%	89 18.2%	489 100%
Grant active	94 8.3%	204 18.1%	311 27.6%	213 18.9%	306 27.1%	1128 100%
Total	286 17.7%	263 16.3%	394 24.3%	279 17.3%	395 24.4%	1617 100%

Table 3. *Number of references cited in a final grant report (n=1617, p = .000)*

	0	1–9	10–19	20–29	30+	Total
Grant non-active	79 14.1%	49 8.8%	92 16.4%	133 23.8%	207 36.9%	560 100%
Grant active	18 1.5%	69 5.8%	160 13.5%	327 27.6%	611 51.6%	1185 100%
Total	97 5.6%	118 6.8%	252 14.4%	460 26.4%	818 46.8%	1745 100%

Table 4. Number of references cited in an article for publication (n=1745, p = .000)
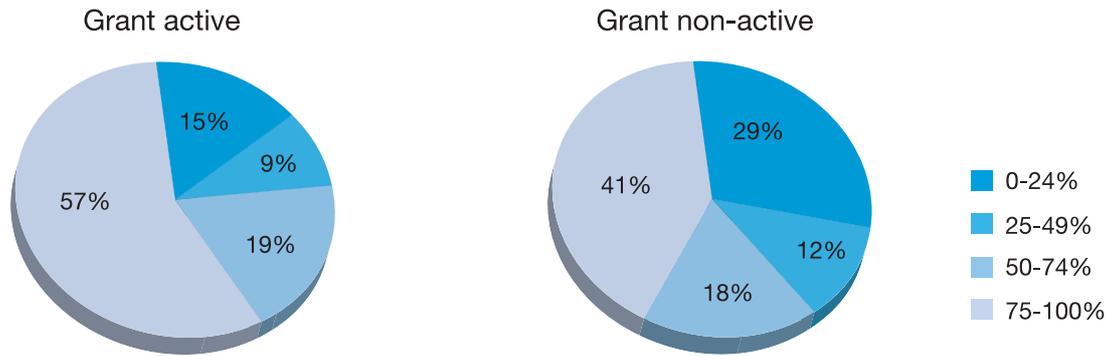

Figure 1. Percentage of articles accessed electronically from the library's collection (n=1757, p= .000)

	0	1–9	10–19	20–29	30+	Total
Grant non-active	114 21.3%	174 32.4%	61 11.4%	52 9.7%	136 25.3%	537 100.0%
Grant active	52 4.6%	481 42.3%	207 18.2%	123 10.8%	273 24.0%	1136 100.0%
Total	166 9.9%	655 39.2%	268 16.0%	175 10.5%	409 24.4%	1673 100.0%

Table 5. Number of articles read for each article cited (χ^2 = 122.522, n = 1673, p = .000)

	0-3	4-5	6-9	10+	Total
Grant non-active	311 56.9%	113 20.7%	35 6.4%	88 16.1%	547 100.0%
Grant active	620 53.3%	273 23.5%	85 7.3%	185 15.9%	1163 100.0%
Total	931 54.4%	386 22.6%	120 7.0%	273 16.0%	1713 100.0%
*outliers removed					

Table 6. Hours spent finding/accessing articles and/or books per week (χ^2 = 2.612, n = 1710, p = .455)

One surrogate for value that has been used in the past is time, the reasoning being that people's time is valuable to them and that the more time spent on an activity, the more value it has. Faculty at all seven universities report spending an average of 5.66 hours finding and/or accessing articles and/or books per week, and the percentage of both grant active and non-active who spend more than four hours per week finding and accessing materials is slightly under half (Table 6).

All respondents also report they spend a good deal of time each week reading work-related articles and books (in addition to finding those readings), and there is no significant difference between grant active and non-active reading time, both spending about 12 hours a week (12.45 on average) reading for work. Grant-active individuals are more likely to spend four or more hours per week reading (Table 7).

	0–3	4–5	6–9	10+	Total
Grant non-active	111 20.4%	76 13.9%	62 11.4%	296 54.3%	545 100.0%
Grant active	143 12.2%	223 19.1%	133 11.4%	654 57.3%	1153 100.0%
Total	254 15.0%	299 17.6%	195 11.5%	950 55.9%	1698 100.0%
*outliers removed					

Table 7. Hours spent reading work related materials per week (χ^2 = 22.205, p = .000)

Conclusions

Returning to the idea of context, an important part of setting the context for the results of this study came from interviews with administrators at all the institutions. Certain ideas about how the library could benefit the institution's goals tended to recur in these interviews, with five specific goals standing out. Administrators and libraries can work together to:

1. attract outstanding faculty,
2. retain outstanding faculty,
3. foster innovative research,
4. build the research reputation of the institution, and
5. promote seamless integration of the library with institutional research activities.[51]

This study of the role of libraries, e-collections and citing in research starts to address these goals by showing the importance of the use of library resources at all stages of the grant process. The results of this study led naturally to the observation that there is a great need for similar assessment and value calculations for other areas of the library and ideally for the library as a whole. It is not as simple, however, as applying the same technique to every area of academic libraries. A follow-on project was conceived to address this more complex goal. This new study, 'Value, Outcomes and Return on Investment of Academic Libraries' ('Lib-Value') is a three-year study funded by the Institute of Museum and Library Services with the goal of developing a strategy for measuring and communicating the value and return of all aspects of academic libraries to their institutions (http://libvalue.cci.utk.edu/).

Recently, Cornell University Library (CUL) Research and Assessment Unit attempted to calculate the financial value of their libraries' services using contingent valuation. They estimated the cost to users to procure services elsewhere if CUL did not exist, including the 'use of physical volumes, articles accessed online and through interlibrary services, answering questions to build research skills and contribute to Cornell research results, in-depth consultations that contribute to Cornell research results, use of preprints from arXiv.org, distributing Cornell-created content to the world through eCommons, and laptops borrowed'. Using various means to calculate a dollar value for this admittedly partial list of services, they found that while in 2008/2009 it cost $56,678,222 to maintain Cornell's 20 libraries, the value of the services provided was at least $90,648,785.[52]

Interestingly, the team at Cornell does *not* include some things in their calculations. Among the things not included are the value of the use of space, including carrels and study spaces, the value of library instruction and its contribution to student success, and the value to users of archival materials and special collections. They note that it is hard to quantify or assign a dollar value to these items. Feedback from librarians at ARL workshops echoed this judgment and called for more study and development of ways to measure these more elusive areas. Accordingly, Lib-Value is developing studies in each of these areas, as well as others.

The scope of the task is quite large. Developing transferable strategies for performing a comprehensive value assessment of the academic library is a highly difficult and complex task. Oakleaf[53] has developed an excellent framework for thinking about value, and she has identified areas that need further study and development. It is likely that in reality, most libraries will not have the time or resources to do comprehensive evaluations regularly, but will instead take the bits and pieces of the models and tools available to them that are most relevant for each unique situation.

References

1. Wilson, C S and Tenopir, C, Local Citation Analysis, Publishing and Reading Patterns: Using Multiple Methods to Evaluate Faculty Use of an Academic Library's Research Collection, *Journal of the American Society for Information Science & Technology*, 2008, 59(9), 1393–1408.

2. Spence, A M, An Economist's View of Information, *Annual Review of Information Science and Technology*, 1974, 9, 57–78.

3. Hindle, A and Raper, D, The Economics of Information, *Annual Review of Information Science and Technology,* 1976, 11, 27–54.

4. Mick, C K, Cost Analysis of Information Systems and Services, *Annual Review of Information Science and Technology,* 1979, 14, 37–64.

5. Lamberton, D M, The Economics of Information and Organization, *Annual Review of Information Science and Technology,* 1984, 19, 3–30.

6. Repo, A J, The Value of Information: Approaches in Economics, Accounting, and Management Science, *Journal of the American Society for Information Science,* 1989, 40, 68–85.

7. Braman, S, The Micro- and Macroeconomics of Information, *Annual Review of Information Science and Technology*, 2005, 40, 3–52.

8. Machlup, F, Uses, Value, and Benefits of Knowledge, *Knowledge, Creation, Diffusion, Utilization,* 1979, Sage Publications, Inc. Reprinted in *Knowledge, Creation, Diffusion, Utilization*, 1993, 14(4), 448–466.

9. Tenopir, C and King, D W, Perceptions of Value and Value Beyond Perceptions: Measuring the Quality and Value of Journal Article Readings, *Serials,* 2007, 20(3), 199–207.

10. Saracevic, T and Kantor P B, Studying the Value of Library and Information Services. Part I. Establishing a Theoretical Framework, *Journal of the American Society for Information Science*, 1997, 48, 527–542.

11. Matthews, J R, *The Evaluation and Measurement of Library Services*, 2007, Westport, Connecticut, Libraries Unlimited.

12. Oakleaf, M, *Value of Academic Libraries: A Comprehensive Research Review and Report*, 2010, Chicago, Association of College and Research Libraries, Published online at www.acrl.ala.org/value (accessed 30 September 2010).

13. Oakleaf, M, ref. 12.

14. Missingham, R, Libraries and Economic Value: A Review of Recent Studies, *Performance Measurement and Metrics*, 2005, 6, 142–158.

15. Marshall, J, *The Impact of the Special Library on Corporate Decision-making*, 1993, Washington, DC, Special Libraries Association.

16. Griffiths, J M and King, D, *Special Libraries: Increasing the Information Edge*, 1993, Washington, DC, Special Libraries Association.

17. Tenopir, C, Wilson, C S, Vakkari, P, Talja, S and King, D W, IFLA Conference Proceedings, 2008, 1–16.

18. Research Information Network (RIN), *Communicating Knowledge: How and Why UK Researchers Publish and Disseminate their Finding,* 2009, London: The Research Information Network.

19. King, D W, Tenopir, C, Choemprayong, S and Wu, L, Scholarly Journal Information-seeking and Reading Patterns of Faculty at Five US Universities, *Learned Publishing*, 2009, 22(2), 126–144.

20. Jones, D Y, How Much do the "Best" Colleges Spend on Libraries?, *College & Research Libraries,* 2007, 68(4), 343–351.

21. Budd, J M, Faculty Publishing Productivity: Comparisons over Time, *College & Research Libraries*, 2006, 67(3), 230–239.

22. Mezick, E M, Return on Investment: Libraries and Student Retention, *The Journal of Academic Librarianship*, 2007, 33(5), 561–566.

23. Vakkari, P and Talja, S, Searching for Electronic Journal Articles to Support Academic Tasks: A Case Study of the Use of the Finnish National Electronic Library (FinELib), *Information Research*, 2006, 12(1) paper 285. http://informationr.net/ir/12-1/paper285.html (accessed 30 September 2010).

24. Wilson, C S and Tenopir, C, ref. 1.

25. King, D W, Tenopir, C, Choemprayong, S and Wu, L, ref. 19.

26. Korobili, S, Tilikidou, I and Delistavrou, A, Factors that Influence the Use of Library Resources by Faculty Members, *Library Review,* 2006, 55, 91–105.

27. Borrego, A, Anglada, L, Barrios, M and Comellas, N, Use and Users of Electronic Journals at Catalan Universities: The Results of a Survey, *Journal of Academic Librarianship*, 2007, 33(1), 67–75.

28. Kurata, K, Matsubayashib, M, Mine, S, Muranushi, T and Ueda, S, Electronic Journals and their

Unbundled Functions in Scholarly Communication: Views and Utilization by Scientific, Technological and Medical Researchers in Japan, *Information Processing & Management,* 2007, 43(5), 1402–1415.

29. Kurata, K, Mine, S, Morioka T, Sakai Y, Kato S and Ueda S, Reading and Information Seeking Behavior of Japanese Medical Researchers in the Era of the Electronic Journal and Open Access, *Library and Information Science,* 2009, 61, 59-90. [In Japanese with English abstract.]

30. Zainab, A N, Huzaimah, A R and Ang, T F, Using Journal Use Study Feedback to Improve Accessibility, *Electronic Library,* 2007, 25(5), 558–574.

31. Voorbij, H and Ongering, H, The Use of Electronic Journals by Dutch Researchers: A Descriptive and Exploratory Study, *Journal of Academic Librarianship,* 2006, 32(3), 223–237.

32. Baldwin, C and Pullinger, D, What Readers Value in Academic Journals, *Learned Publishing,* 2000, 13(4), 229–239.

33. Montgomery, C H and King, D W, Comparing Library and User Related Costs of Print and Electronic Journal Collections, *D-Lib Magazine*, 2002, 8(10), http://www.dlib.org/dlib/october02/montgomery/10montgomery.html (accessed 30 September 2010).

34. McClanahan, K, Wu, L, Tenopir, C and King, D W, Embracing Change: Perceptions of E-journals by University Faculty Members, *Learned Publishing,* 2010, 23(3), 44–57.

35. Tenopir, C and King D W, ref. 9.

36. Tenopir, C and King, D W, *Value and Future of Library E-Resources*, 2010, VALA 15th Biennial Conference and Exhibition, Melbourne, Australia.

37. Tenopir, C and King, D W, *Towards Electronic Journals: Realities for Scientists, Librarians, and Publisher,* 2000, Washington, D.C., Special Libraries Association.

38. Tenopir, C and King, D W, ref. 36.

39. King, D W, Aerni, S, Brody, F, Herbison, M and Knapp, A, The Use and Outcomes of University Library Print and Electronic Collections, *The Sara Fine Institute for Interpersonal Behavior and Technology*, 2004, http://web.utk.edu/~tenopir/research/pitts/Pitt_Use_Final.pdf. (accessed 30 September 2010).

40. British Library, Measuring Our Value, 2004, British Library, London, available at: www.bl.uk/pdf/measuring.pdf (accessed 30 September 2010).

41. Barron, D B, Williams, R V, Bajjaly, S, Arns, J and Wilson, S, The Economic Impact of Public Libraries in South Carolina, *SCEIS*, 2005, Atlanta, GA, available at: www.libsci.sc.edu/SCEIS/home.htm (accessed 30 September 2010).

42. Griffiths, J M, King, D W, Tomer, C, Lynch, T and Harrington J, *Taxpayer Return on Investment in Florida Public Libraries*, 2004, State Library & Archives of Florida, Tallahassee, FL, http://dlis.dos.state.fl.us/bld/roi/pdfs/ROISummaryReport.pdf. (accessed 30 September 2010).

43. Library Research Service, *Return on Investment for Public Libraries*, 2007, www.lrs.org/public/roi/(accessed 30 September 2010).

44. Levin, Driscoll, and Fleeter, *Value for Money: Southwestern Ohio's Return from Investment in Public Libraries.* 2006, Columbus, OH, http://9libraries.info/docs/EconomicBenefitsStudy.pdf. (accessed 30 September 2010).

45. St Louis Public Library, *Public Library Benefits Valuation Study*, 1999, St Louis Public Library, St Louis, MI, http://www.slpl.lib.mo.us/libsrc/valuationtoc.htm (accessed 30 September 2010).

46. Strouse, R, Demonstrating Value and Return on Investments: The Ongoing Imperative, *Information Outlook,* 2003, 7(3), 14–19.

47. Griffiths, J M and King, D, ref. 16.

48. Kaufman, P T and Watstein, S B, Library Value (Return on Investment, ROI) and the Challenge of Placing a Value on Public Services, *Patent,* 2008, 226–231.

49. Luther, J, University Investment in the Library: What's the Return? A Case Study at the University of Illinois at Urbana-Champaign, *Library Connect White Paper #1, Elsevier,* 2008, http://libraryconnect.elsevier.com/whitepapers/0108/lcwp010801.html. (accessed 30 September 2010).

50. Tenopir, C, Love, A, Park, J, Wu, L, Baer, A and Mays, R, University Investment in the Library, Phase II: An International Study of the Library's Value to the Grants Process, Prepared for Elsevier Connect, 2010, http://libraryconnect.elsevier.com/whitepapers/roi2/lcwp021001.html.

51. Tenopir, C and King, D W, *Measuring (and Increasing) the Value of Academic Libraries*, 2010,

Korean Society of Library and Information Science 40th Anniversary International Conference.

52. Cornell University Library, *Library Value Calculation*, 2010,
    http://research.library.cornell.edu/value (accessed 30 September 2010).

53. Oakleaf, M, ref. 12.

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