

ROI Task Force

Final Report

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INTRODUCTION

The primary responsibility of the ROI Task Force is to investigate Return on Investment (ROI) / Cost Benefit Analysis (CBA) tools and assess their value for use by the Health Sciences and Human Services Library (hereafter referred to as HS/HSL). The automated calculators from the National Network of Libraries of Medicine (NN/LM) were the principle resources utilized in determining the CBA and ROI figures for the Library's books, journals, and one database. The "Cost Benefit Analysis/Return on Investment" section of this report discusses the data compilation process and final results with the details included in five appendices.

During the course of researching cost benefit analysis and return on investment practices it became evident that the final report would not be complete without briefly describing the evolving trends in valuation methods especially with respect to library processes. The "Intangibles" and "Social Return on Investment" sections present overviews of strategies that have become increasingly more popular over the last two decades as the need to "value" intangible activities has grown. Public libraries, in particular, have creatively adapted techniques from the business and nonprofit sectors to assess the "worth" of specific projects and services. The University of Illinois at Urbana-Champaign's CBA case study (described in the "Cost Benefit Analysis/Return on Investment" section) and the automated calculators recently developed by the NN/LM MidContinental Region are evidence of a growing interest among library administrators to expand financial reporting beyond the traditional expenditure and revenue cycle. The Task Force hopes that the information within this report provides sufficient background to warrant continued investigation of return on investment and cost/benefit strategies and their applicability to the HS/HSL.

Acknowledgements

We wish to acknowledge the significant contribution of Betsy Kelly, the NN/LM MidContinental Region's Assessment and Evaluation Liaison at the Washington University School of Medicine. Without Betsy's precise explanations and thoughtful suggestions we would not have had such a comprehensive understanding of the statistics required for the calculators or their functionality. We owe her an immense debt of gratitude.

COST BENEFIT ANALYSIS / RETURN ON INVESTMENT

NN/LM MidContinental Region CBA/ROI Tools

The primary “product” of a library organization is the services associated with organizing and facilitating access to information. While most aspects of service-related activities are difficult to quantify there are accepted strategies for assessing value which are discussed in the “Intangibles” section of this report. However, library processes do encompass “tangible” elements as well (costs of materials, salaries, usage statistics, etc.) which are measurable by standard practices and may be used to calculate cost and benefit figures. The NN/LM MidContinental Region has been active in promoting “Return on Investment” (ROI) and “Cost/Benefit Analysis” (CBA) statistics to enable library administrators to compare expenditures and benefits, identify trends for planning purposes, and to provide quantifiable justification of a library’s value to its community.

CBA and ROI figures are calculated using the two simple formulas described below:

Expressed as a ratio, CBA is a comparison between a dollar spent versus dollars reaped in benefit. Therefore, a CBA of 7 : 1 indicates that for every dollar spent, 7 dollars are reaped in benefit. The formula is:

$$\frac{\text{Total Benefit}}{\text{Total Cost}}$$

ROI is expressed as a percentage and represents the “rate of return” (loss or gain) versus the initial “investment” (total cost). More familiar terms used to describe ROI are “interest” and “profit/loss”. The formula is:

$$\frac{(\text{Total Benefit} - \text{Total Cost})}{\text{Total Cost}} \times 100$$

At the time the ROI Task Force was formed in October 2009 the NN/LM MidContinental Region website included an automated calculator (<http://nnlm.gov/mcr/evaluation/roi.html>) for determining a library’s ROI and CBA statistics for books, journals, and for both types of resources combined. Also available for viewing was a one-hour webinar (<https://webmeeting.nih.gov/p85613275/>) presented by Betsy Kelly (Assessment and Evaluation Liaison - Washington University School of Medicine) and Barbara Jones, (Missouri/Advocacy Liaison - University of Missouri – Columbia) which provided guidance for collecting data and included practical examples of the functionality of the calculator. The presenters emphasized the importance of using “justifiable” values throughout the process. Additionally, Betsy Kelly was contacted for further clarification of the formulas used in the calculator (they are hidden from view) and she graciously responded with a thorough explanation of everything needed for the Task Force to proceed with gathering the HS/HSL-specific numbers.

Data Compilation/Calculations For HS/HSL

CBA/ROI for books and journals:

There are a total of 21 data elements in the NN/LM books/journals calculator. Appendix 1 is a facsimile of the calculator form to which red numbers (from 1-21) have been added for each field. Appendix 2 is a detailed explanation of every HS/HSL figure used in the form including the person within the Library who provided the information and all calculations where appropriate. The red numbers correspond to those appearing on the facsimile of the form.

The Task Force decided to collect data from FY08 (July 2007-June 2008) based on the assumption that standard reports regularly issued by the HS/HSL had been completed and were readily available for that fiscal year. Although Appendix 2 provides the details of each HS/HSL figure used in the calculations for CBA and ROI a few warrant additional explanation:

Field 1: Users' average annual salary: According to the recently completed Brinley Franklin survey, approximately 69% of the HS/HSL user population is comprised of either UMB BS students (12.5%) or UMB graduate students (56.5%). In the two practical demonstrations of the NN/LM calculator during the webinar Betsy Kelly and Barbara Jones used averages of \$100,000 and \$60,000. The Task Force felt that the figure for the HS/HSL is considerably lower given the Library's user profile, however, estimating a justifiable salary proved problematic. An inquiry was sent to Betsy Kelly and she responded by suggesting that tuition, financial aid, and stipend data could be substituted for salaries and weighted appropriately.

Average financial assistance totals for both graduate and undergraduate students were obtained from Student Financial Assistance and Education while average UMB employee salary data was supplied by Human Resource Services for the faculty/postdoc category. Additionally, the survey indicated that 9% of the HS/HSL user population was associated with UMMC/UMMS. Since salary data was unavailable for this particular group the Task Force decided to use UMB's figure based on the similarity of work environments and geographical location. Data for the 4% of unaffiliated users was calculated using Baltimore salary and unemployment statistics from the U.S. Department of Labor, Bureau of Labor Statistics (<http://www.bls.gov/ro3/qcewmd.htm>) and the Maryland Department of Labor, Licensing and Regulation (<http://www.dllr.state.md.us/lmi/laus/baltimorecity.shtml#2008>).

It should be noted that the Users' average annual salary figure has very little impact on the CBA and ROI results. The Task Force tested a variety of scenarios with different values for salary and usage statistics and discovered that the latter had a far greater effect on the final result than user salary or hours worked.

Field 2: Users' hours worked per year: As with the Users' average annual salary this figure is difficult to quantify for a student group. The full-time total of 2080 hours per year was considered to be the most "justifiable" even for the student population, given the considerable hours spent on academic activities.

Field 4: Number books borrowed or used: The print total does not include monographs that were used “in house” (left on tables or in study rooms). That statistic is not currently maintained.

The e-book total does not include statistics from July 2007-Dec. 2007 for the following collections: Springer E-Book Behavioral Sciences, Springer E-Book Biomedical & Life Sciences, Springer Medicine, or *STAT!Ref*. Usage figures for the first six months of FY08 were not available for those resources.

The CBA and ROI values for the HS/HSL are as follows:

Books:	CBA = 27.0 : 1 (for every dollar spent 27.0 dollars are returned in benefit) ROI = 2,603% (benefit return over and above total cost)
Journals:	CBA = 20.0 : 1 (for every dollar spent 20.0 dollars are returned in benefit) ROI = 1,899% (benefit return over and above total cost)
Combined:	CBA = 21.2 : 1 (for every dollar spent 21.2 dollars are returned in benefit) ROI = 2,017 (benefit return over and above total cost)

CBA/ROI for Databases:

In late January, the Task Force was charged with investigating the potential of the second calculator for computing CBA and ROI values for the HS/HSL databases (<http://nnlm.gov/mcr/evaluation/dbroi.html>). A textual explanation of its functionality is included on the website; however, there is currently no practical demonstration available for viewing as exists for the books and journals tool. The calculator may be used for a single database or multiple databases. The latter option requires that only those resources reporting the same type of usage statistics (number of searches, number of sessions, etc.) be included. Appendix 3 is a facsimile of the calculator form.

The FY08 list of HS/HSL databases was reviewed and reduced to thirteen by eliminating those that were non-COUNTER compliant, free, or not technically databases (ex: *Ulrich's*). (See Appendix 5 for the list of titles.) Usage statistics are reported as “sessions” for three of the thirteen while ten report them as “searches”, “queries”, or “activities”.

The Task Force reviewed the list, experimented with several scenarios, and discovered that computing ROI and CBA values for multiple databases is extremely difficult. Each resource is different, consequently, it is impossible to determine justifiable figures for some required elements such as Average user time saved and Average search fee. Inclusion of the EBSCO activity inordinately skews the results due to high usage (45% of the total) and extremely low cost (1.6% of total). Additionally, most of the statistics are reported as individual searches which

are not representative of how databases are utilized. Search fees are customarily based upon sessions not individual searches. Therefore, session statistics more closely parallel other elements required for the automated tool.

The Task Force concluded that the single database option is the most pragmatic approach to using the calculator and selected *MD Consult* as a “typical” example. The statistics are reported as sessions and the cost in comparison to usage is within acceptable limits. The content is comprised of journals and books and it is clinical in scope.

Appendix 4 provides the detail of each element used in the calculator and is similar to the books/journals explanation with the red numbers corresponding to the numbers in the facsimile of the form.

The CBA and ROI values for the *MD Consult* database are:

CBA = 23.1 : 1 (for every dollar spent 23.1 dollars are returned in benefit)
ROI = 2,209% (benefit return over and above total cost)

CBA/ROI: Discussion

The NN/LM’s automated tools exclude any elements reflecting overhead costs (heat, light, storage, etc.) and the Task Force considered whether or not these types of expenses should be included in future CBA/ROI calculations. Apportioning these “indirect expenditures” to each category of resource would be difficult and unique to the situation of each library. The HS/HSL houses multiple campus offices and contains study spaces that surround the collection on each floor. As a result, the building must be heated and lit regardless of the books, shelving, services and resources that are made available. For accounting purposes, shelving purchased and installed with the construction of the building is considered to be a “sunk cost”, or a past expenditure, which cannot be recouped. Therefore, the Task Force decided not to recommend investigating overhead expenses as an element of future CBA/ROI calculations.

Compiling the numbers for the calculators proved more complicated than simply selecting figures from a variety of reports (a problem that was discussed in the webinar). Some elements required significant computation (ex: Average user salary) while other totals were based on “best guess” estimates (ex: Total staff time spent managing the resources). The HS/HSL statistics obtained from a variety of sources often required repeated clarification to ensure that there were no misunderstandings regarding what was or was not included. This was a painstaking and time consuming process.

Obviously, the CBA and ROI values for HS/HSL resources are substantial even though the Task Force chose conservative figures where appropriate to minimize the possibility of inflating the results. As mentioned previously, in experiments with different scenarios it became apparent that the usage statistics have a profound effect on the calculations, certainly far more so than Users’ average annual salary or hours worked. Since the HS/HSL usage data were either taken from

Aleph or provided by vendors the Task Force has confidence in their accuracy. User time saved also affects the CBA and ROI values although not quite as significantly as the usage statistics. Unlike the number of circulations or search sessions, User time saved is not as easily determined. Quantifying this element for the database calculator was especially challenging since it is dependent upon the complexity of each search and the length of time it would take to obtain similar results by other means. The figure of 20 minutes was chosen since it was used for the journal calculations, considered to be a minimum and, therefore, “justifiable”.

Finally, of all of the data collected for this project the book usage statistics are particularly noteworthy. Print in comparison to the electronic format is in the minority representing only 17% of the total versus 83% for online. Moreover, the electronic accesses were overwhelmingly from *MD Consult* which comprised 94% of all e-book use for FY08. The absence of statistics for Springer and *STAT!Ref* resources from July through December 2007 can only partially explain the disparity. Another contributing factor could be attributable to the familiarity of users with the availability of *MD Consult* while the Springer and *STAT!Ref* products were recent additions to the HS/HSL e-book collection in FY08. Certainly if the *MD Consult* statistics are indicative of the popularity of e-books the usage should rise for succeeding years and affect the CBA/ROI values accordingly.

One additional NN/LM tool that the Task Force did not investigate due to time constraints is the “Valuing Library Services” calculator (<http://nmlm.gov/mcr/evaluation/calculator.html>). The functionality is based on assigning “market value” to all library services such as resources usage statistics, mediated searching, meeting room availability, computer and AV use, ILL processes, class hours taught, etc. Compiling data for this calculator would require input from every single department within the Library as well as researching and selecting justifiable “market value” equivalents.

Applying Cost Benefit Analysis to Grants: A Project at the University of Illinois at Urbana-Champaign

This case study was the subject of a Vision Session presented by Carol Tenopir (School of Information Sciences, University of Tennessee) during the 2009 Annual NASIG meeting. A discussion of the UIUC experience was published as a white paper in Elsevier’s *Library Connect* the full text of which is accessible via the following URL:

<http://libraryconnect.elsevier.com/whitepapers/lcwp0101.pdf>.

The strategy in this study directly links electronic journal usage, in the form of citations used in grant proposals, with the institution’s grant income. Data was compiled from a variety of departments (number of grant proposals/awards, number of tenured faculty, principal investigators, etc.) and from a faculty survey. The UIUC model compares the proportion of grant income using library resources to the total library budget with the result that every dollar invested returns \$4.38 in grant funding.

The investigators chose grant income because it is tangible (actual dollars) and related to the “strategic goals” of the institution (goal: attract and retain talented faculty through publishing

research that's supported by grant funding – the higher the grant income the more articles published, the greater the number of dynamic faculty who are attracted to the institution).

The NN/LM calculators provide a means by which library resources can be valued in terms of time and dollars saved by users. This study presents a methodology that directly relates resources to income generation in the form of a CBA statistic. The data compilation and manipulation for a similar initiative at the HS/HSL would be considerably time-consuming and more difficult than that associated with the NN/LM tools. Grant awards are often multi-year contracts and can change over time while surveys are notoriously labor intensive to administer and evaluate. However, the potential reward of providing quantifiable justification of the Library's contribution to the institution's "bottom line" is significant.

INTANGIBLES

An intangible is something that cannot be held in your hands, seen, touched, or physically measured. The opposite would be a tangible asset such as a book or journal that is physical in nature and can be counted, priced and viewed by others. Familiar examples of intangibles include trademarks, brand name value, copyrights, intellectual knowledge, innovations and patents, experience, relationships and reputation. The most widely recognized and accepted methods for assigning value to non-monetary assets are by using cost, market, and income approaches [1]. These practices utilize techniques such as correlating an intangible with a similar service or product that has an established cost or by determining worth according to what the market would bear. With respect to libraries, the latter is often determined through the use of surveys and focus groups.

The business sector has recognized the benefit of including intangible financial information in annual reports and for investor relations purposes. For the HS/HSL and similar organizations, valuing these asset types provides management and institutional administrators with a more comprehensive fiscal analysis of all activities and processes and is a useful tool in identifying trends, assessing the effectiveness of programs and services, and in predicting future needs. To determine the value of the HS/HSL's services and resources it is important to consider the intangibles that contribute to the overall success of the Library.

Specific examples of intangibles relevant to libraries include *human* capital such as staff education and experience, professional activities, and motivation. The *structural* capital category encompasses library systems, information value of a collection, level of information technology literacy, leadership, culture, management systems and WEB 2.0 services. Finally, *relational* capital aspects such as user training and collaboration between academics and subject specialists have intrinsic worth and may be considered as well [2].

Methods of Valuating Intangibles

Frank Portugal's, *Valuating Information Intangibles*, presents four methodologies for analyzing and estimating the value of an intangible: return on investment (ROI) and cost-benefit analysis, knowledge value-added, intranet team forums, and intellectual capital valuation [3]. Each method presents its own measurement benefits and challenges.

ROI and cost-benefit analysis practices are more suitable for tangible calculations although they can be utilized once monetary worth has been assigned. Knowledge value-added tracks a process from inception to completion. For example, knowledge, skill, and perhaps additional learning may be required for instituting a new service or system. The attributes necessary to manage a project from initiation to implementation has worth and represents knowledge value-added. The actual measurement is the amount of time invested in learning the processes required for the project. Intranet team forums depend on technology to estimate the intangible value of library information and services based on measures of communications such as forums created, chat software, and other online sources used within the library.

The fourth methodology, intellectual capital valuation, monitors trends of improvement or decline by evaluating customer satisfaction, technology applications, employee satisfaction and training, and human aspects such as staff motivation, employee awareness, and turnover. The financial focus is a measure of performance outcome and includes profits and revenue.

Measuring intellectual capital is extremely important since it represents an investment the library has made in the knowledge, skills, innovativeness and productivity of the staff. Although intellectual capital cannot be measured directly there are two groups of metrics useful in measuring it indirectly. One is the performance over time and the second is the outcome of that performance. An example of this for the HS/HSL might be the teaching of a class by a librarian on how to use a resource. The second measurement would be the extent of improvement in a patron's ability to utilize the resource after having taken the class.

Application of Intangibles to the Health Sciences and Human Services Library

HS/HSL-specific examples of intangible include:

- Cultivating relationships with Friends of the Library have resulted in significant monetary donations and the establishment of grant partnerships and awards. These beneficial connections are directly attributable to the knowledge, skill, and initiative of specific professional staff.
- Skilled staff assist students, faculty and researchers in using the Library's resources to fully optimize the information available. This is considered to be intellectual capital and value-added.
- Technically proficient staff members have created applications and designed systems that have improved the delivery of services to users. The development of web pages and tutorials that can be viewed through mobile technologies have served to expand and enhance the use of resources beyond the physical limits of the Library. Without highly talented personnel the cost of implementing these innovations would be prohibitive.
- The knowledge and skills of two librarians were used to conduct focus groups for UMB's Work Life Project. This is an example of how specific expertise within the Library benefitted the entire campus.

As a service oriented organization with a highly educated, skilled, and multidimensional staff, the inclusion of intellectual capital contributions in assessing the overall "value" of the Library is critical.

Valuing the human capital within the HS/HSL begins with the educational attainments and professional longevity of its employees. For example, of the total of 64 staff members, 29 (45.3%) hold master's degrees and 12 hold bachelor's degrees. Fully 64% have an educational level of bachelor's degree or higher. Additionally, two employees are currently working on first or second master's degrees while two are working to complete their undergraduate degrees. The wealth of experience of the staff is equally impressive. The average number of years working within the profession for HS/HSL employees with a library-related master's degree is 17.3. Of this group, 68% (19 of 28) have 10 or more years of experience working in a library.

Human capital is only one example of the type of asset that may be considered for evaluation in financial terms. There is no doubt that there is significant “worth” in the form of the services and resources that the Library provides and traditional accounting practices of comparing expenditures and revenues reflect only one aspect of overall activities. Incorporating accepted methodologies to value heretofore unrecognized assets would result in fiscal reporting more representative of the HS/HSL in its entirety and serve to emphasize its considerable contributions to the campus community.

Notes

1. Reilly RF, Schwiehs RP. Valuing intangible assets. New York: McGraw-Hill; 1999.
2. Kostagiolas P, Asonitis S. Intangible assets for academic libraries: definitions, categorization and an exploration of management issues. *Libr Manage*. 2009;30(6/7):419-429.
3. Portugal F. Valuating information intangibles: measuring the bottom line contribution of librarians and information professionals. Washington, DC: Special Libraries Association; 2000.

SOCIAL RETURN ON INVESTMENT (SROI)

Social return on investment is a methodology for measuring the social or environmental impact of a business, organization, project, or process. Created in the 1990's, SROI was developed in recognition of the need for tools that facilitate "monetizing" intangible social benefits especially for use in service and non-profit entities.

For the HS/HSL, *Worth Their Weight: An Assessment of the Evolving Field of Library Valuation* (<http://www.bibliotheksportal.de/fileadmin/0themen/Management/dokumente/WorthTheirWeight.pdf>), is an extremely timely and relevant report that explores recent initiatives within the public library sector to quantitatively analyze their services and activities. Issued in 2007 by the Americans for Libraries Council (ALC), the first section discusses the justifications for public libraries to adopt economic valuation methodologies for identifying and measuring social impact elements. Current trends, strategies, and calculation tools from the business and non-profit communities are also described. The second section is comprised of summaries of a variety of research endeavors undertaken by individual libraries and library consortia for the purpose of analyzing total benefits and costs. Calculations for most of the projects combine standard metrics (circulation figures, operations expenditures, population statistics, etc.) with strategies such as "indirect secondary impact" and "contingent valuation" using data compiled from surveys, interviews, and/or focus groups. Incorporating the two types of measurements provides a far more complete assessment of the "worth" of a library than simply comparing expenditure and revenue figures.

The ALC report devotes an entire section to the concept of social return on investment at the organizational level and includes descriptions of four social responsibility models: Balanced Scorecard, Triple-Bottom Line Accounting, Corporate Social Responsibility Reports, Evidence-Based Policy and Practice Framework. Arguably, the Balanced Scorecard is perhaps the most adaptable to the library environment with four "perspectives" that serve as guides for identifying and tracking the elements required to assess overall performance. Financial metrics, customer satisfaction/valuation, efficiency measures, and employee learning and growth potential are sufficiently general in nature to be applicable to most organizations and allow flexibility in establishing context-based criteria/goals. The ultimate objective of the Balanced Scorecard approach is to provide management with a broadly based tool for the purposes of strategic planning and measuring progress.

The concept of SROI may be easier to describe than it is to implement, however. The process is complex and predicated on a thorough understanding of all associated elements and valuations. In Olson and Lingane's white paper, *Social Return on Investment: Standard Guidelines* (<http://escholarship.org/uc/item/6xp540hs>), the authors explain that SROI analysis is often flawed due to a lack of standardization of principles and definitions or a clear understanding of the data to be included in the calculations. They propose ten guidelines that address the most common problems of consistency, accuracy, and relevance. While the focus of the paper is on entrepreneurs, business plans and "projected" social impact, the standards can be applied to "actual" assessments as well.

Interest in SROI methodologies and metrics has grown significantly over the last two decades corresponding to the increase in awareness of the social and environmental impacts of organizational functions. As evidenced by the *Worth Their Weight* document, some public libraries have recognized the need to provide their fiscal managers with comprehensive reports of financial activity which include social benefit/cost components. Inspired by the public library examples, the Task Force identified some HS/HSL projects and services as possible candidates for SROI review including: the Parish Nurse Program, HealthyMe@UMB, Food for Fines, bibliographic instruction activities for Residents and Fellows, and the availability of reference assistance and workstations for the general public.

CONCLUSION / RECOMMENDATIONS

Depending upon the ease with which required data can be compiled, the books and journals calculator on the NN/LM MidContinental Region's website provides a simple, streamlined means by which to determine the ROI and CBA figures for those resources. However, the Task Force feels that the database tool requires further study to fully evaluate its efficacy.

This project began with an examination of the NN/LM calculators for possible use by the HS/HSL. However, as the Task Force reviewed the literature on "valuing" library processes, it became clear that standard ROI and CBA calculations for resources represent only one element in a more complex financial landscape. The evolution of methodologies to facilitate quantifying intangible components of library operations has provided an opportunity to develop a fiscal reporting framework more representative of overall activities. An in-depth analysis of the applicability of valuation tools and strategies for intangibles (including SROI) is well beyond the mission of the Task Force. Therefore, we make the following recommendation:

A standing committee should be appointed to develop procedures to evaluate library services within the context of ROI/CBA and related measures. This will ensure consistency in maintaining, compiling, using, and reporting data for ongoing activities and streamline the identification of relevant elements in future endeavors.

In the short term the committee should consider the following for HS/HSL-related ROI/CBA calculations and information:

- a. Conduct a brief survey of users to provide additional data for the Average annual users salary and Average annual users hours worked figures
- b. Develop a process for collecting usage statistics for monographs that have circulated "in house" (left on tables and in study rooms, etc.)
- c. Institute a time study for selected staff for confirming actual hours spent managing books and journals (and possibly, databases)
- d. Communicate with the appropriate departments the need to collect and maintain specific statistics for use in the calculators
- e. Explore the potential for utilizing the NN/LM's "Valuing Library Services" calculator
- f. Experiment with the NN/LM's database tool to determine "usability" for the HS/HSL
- g. Monitor the NN/LM return on investment efforts and associated activity

In the longer term the committee should research strategies and metrics for applicability to HS/HSL services and resources:

- a) Investigate the feasibility of initiating a project similar to that of the University of Illinois at Urbana Champaign relating e-journal use to grant awards
- b) Analyze current HS/HSL activities to identify intangibles and possible techniques for valuation
- c) Implement a procedure to assess new HS/HSL initiatives for SROI considerations especially those funded by grants, awards, and contracts

- d) Review the summaries of public library projects in *Worth Their Weight: An Assessment of the Evolving Field of Library Valuation* for adaptability for the HS/HSL
- e) Identify individuals on campus who may have expertise in SROI and valuation metrics
- f) Explore the SROI organizational-level models discussed in the *Worth Their Weight* report and evaluate for use by the HS/HSL
- g) Continue to review the literature for additional information regarding trends and ideas

APPENDIX 1
NN/LM CBA/ROI calculator for books and journals

Salary Information:	User's Average Annual Salary 1	\$	Hours Worked Per Year 2	Per Year	Library Salary Budget 3	\$

Benefits	Costs	TOTAL Benefit	TOTAL Cost
Books used (in house or borrowed)		7 \$	10 \$
Number borrowed or used 4			
Average retail cost of a book 5	\$ Book budget 8		
User time saved for each book borrowed (in 10ths of an hr) 6	Portion of all staff time devoted to the book collection (order, receive, catalog, process,shelve,etc) in 10ths 9		
Journals used (in house or borrowed)		14 \$	17 \$
Number articles read by all users 11			
Per article price from a vendor 12	\$ Journal budget (print and electronic) 15		
User time saved per article available through library (in 10ths of an hr) 13	Portion of all staff time devoted to journal collection (order, license, receive, process, manage, shelve, etc.) in 10ths 16		

Clear Form	18 Total Benefits Value: 0.00	19 Total Costs: 0.00
--	---	---

	20 Benefit/Cost Ratio: 0.00	21 ROI %: 0.00
--	--	---

APPENDIX 2

HS/HSL Figures Used in CBA/ROI Calculator for Books and Journals

Books

- 1)** Users' average annual salary:
Classification breakdown of users from Brinley Franklin survey:
- | | |
|------------------------|-------|
| UMB BS students | 12.5% |
| UMB grad students | 56.5% |
| UMB Faculty + Postdocs | 18% |
| UMMC/UMMS | 9% |
| Other | 4% |
- Student "salaries" from Financial Aid:
- | | |
|--------------------|----------|
| Average undergrad: | \$12,034 |
| Average grad: | \$30,630 |
- Average faculty salary from HR: \$96,810.63
- UMMC/UMMS: \$96,810.63 (used faculty figure)
- Other: \$52,624 (average income Baltimore City in 2008 – BLR web site (\$1,012/week x 52))
6.7% (average unemployment rate in BC in 2008 – DLLR web site)
\$49,098 (\$52,624 x .933)
- | | |
|------------------------|--|
| UMB BS | $\$12,034 \times 12.5\% = \mathbf{\$1,504}$ |
| UMB grad students | $\$30,630 \times 56.5\% = \mathbf{\$17,306}$ |
| UMB Faculty + Postdocs | $\$96,810 \times 18\% = \mathbf{\$17,426}$ |
| UMMC/UMMS | $\$96,810 \times 9\% = \mathbf{\$8,713}$ |
| Other | $\$49,098 \times 4\% = \mathbf{\$1,964}$ |
- Average user salary: **\$46,913**
- 2)** Average User Hours worked per year – NN/LM used 2080 which is 40 hours x 52 weeks
= **2080**
- 3)** Library salary budget – includes cost of benefits, but not RML salaries
FY08: **\$2,906,874** (from Aphrodite/Jane)
- 4)** Books - # borrowed or used:
a) Print books used: **16,120** (from circ stats: 13,262 circ'd + 2,858 reserves)

NOTE: Per Persia: Not absolutely certain, but is fairly confident that the 13,262 circ figure does not include books borrowed from other libraries. She believes that the figure is based only on HS/HSL barcode numbers.

NOTE: Per Persia, the “in-house” circs (items left on tables/in study rooms, etc.) cannot be determined from the total reshelve figure of 9,614.

- b) E-books used: **76,113** (from Robin’s figures) includes netLibrary
- c) Total for #4: **92,233**

NOTE: Total does not include statistics from July 2007-Dec. 2007 for Springer E-Book Behavioral Sciences, Springer E-Book Biomedical and Life Sciences, Springer Medicine, or *STATRef!* Of the 76,113 e-book figure, 71,840 (94%) is attributable to usage of *MD Consult* titles.

- 5) Average retail cost of book: **\$111.01** (from Matthews Medical Books report for 2008)

NOTE: This is a figure for print only. However, the e-book cost should be a similar figure.

- 6) User time saved for each book borrowed: **0.25** (one quarter of an hour – from NN/LM)

From Betsy Kelly’s calculation document:

- 7) **Benefit** = (# books x price/book) + ((user salary/hours/year) x (# books x time saved/book))

For HS/HSL:

$$(92,233 \times \$111) + ((\$46,913 / 2080) \times (92,233 \times 0.25))$$

$$\$10,237,863 + (\$22.55 \times 23,058)$$

$$\$10,237,863 + \$519,958 = \mathbf{\$10,757,821 = \text{Benefit figure for books}}$$

- 8) Book budget: (e-mail from Steve)

Print: \$150,282

E-books: \$ 1,569 (2 books thru Ovid)
\$ 728 (Springer Behav Sci)
\$ 9,493 (Springer Biomed & Lif Sci)
\$ 7,918 (Springer Medicine)
\$ 1,477 (*STAT!Ref*)
\$ 5,661 (*MD Consult* – 51 books x \$111 (avg cost of book))

Total book budget: **\$177,128**

NOTE: *MD Consult* consists of both e-books and e- journals. No “official” apportionment of the total cost of \$34,934 for FY08 is available for the two types of publications. Consequently, the e-book figure was calculated by multiplying the average cost of a medical book in 2008 (\$111) by 51, the number of e-books in the package. The result is \$5,661. The total *MD Consult* cost for e-journals (included in Field 17), therefore, was determined by subtracting \$5,661 from \$34,934, or \$29,273 (an average of \$333 per journal).

- 9)** Portion of all staff time devoted to books:
- a) Coll Dev: 71 hours/week (from Steve incl. print + e)
 - b) Cat Mgt: 44.04 hours/week (from Maria and Meg)
 - c) Services: 47 hours/week (from Everly)
 - d) Total hours: **162.04 hours/week**

NOTE: The **162** represents number of staff hours spent on books per week. In order to use it in the cost formula it has to be multiplied by number of weeks in the year, then changed into a percentage of all staff hours worked in a year – expressed in decimal form.

$(162 \times 52) / \text{total hours worked by } \underline{\text{all}} \text{ HS/HSL staff per year}$

$$8,424 / 110,448 = .076$$

NOTE: Total number of HS/HSL staff hours worked in a year figure (110,448) is based on 50 full-time (40 hours/week), 1 part-time (24 hours/week), 5 part-time (20 hours/week) and a 52 week year.

From Betsy Kelly’s calculation document:

- 10) Cost = Book budget + (salary budget (staff) x % staff time to manage book collection)**

For HS/HSL:

$$\$177,128 + (\$2,906,874 \times .076) = \$398,050 = \text{Cost figure for books}$$

CBA for books is benefit figure divided by cost figure =

$$\$10,757,821.00 / \$398,050 = 27.0 \text{ (CBA ratio for books is } 27.0 : 1)$$

ROI for books is (benefit figure minus cost figure) divided by cost figure =

$$((\$10,757,821 - \$398,050) / \$398,050) \times 100 = 2,603\%$$

Journals

- 11) Number articles read by all users:
- a) Print journals: 17,055 (from Persia: “In House Use” of bound and unbound journals – assumption made that one reshelve equals one use)
 - b) E-journals: 1,031,024 (from Robin’s usage sheet)
 - c) Total: **1,048,079**

NOTE: In January 2010, the services division instituted a daily count of print journal use which should provide a more accurate count than the JUS.

- 12) Per article price from vendor: **\$30** (average suggested by NN/LM is \$30 or \$35 per article)
- 13) User time saved per article available in library (in 10ths of an hr.) – NN/LM used **.33** hours (20 mins).

NOTE: It’s not clear how this particular figure was determined except for the amount of time it would take a user to locate a vendor, request the article, and then pay for it or get it from a colleague, etc. NN/LM considers it a conservative figure.

From Betsy Kelly’s calculation document:

- 14) **Benefit** = (# articles x price/article) + ((user salary/hours/year) x (# articles x time saved/article))

For HS/HSL:

$$(1,048,079 \times \$30) + ((\$46,913 / 2080) \times (1,048,079 \times .33))$$

$$(\$31,442,370) + (\$22.55 \times 345,866)$$

$$(\$31,442,370) + (\$7,799,278) = \mathbf{\$39,241,648 = \text{Benefit figure for journals}}$$

- 15) Journal budget (print & electronic): **\$1,707,673** (\$1,663,331 from FY08 AAHSL report, Q. 14 (2nd page), \$29,273 representing the journal portion of *MD Consult*, and \$15,069 bindery costs)
- 16) Portion of all staff time devoted to journal collection:
- a) Coll Dev: 149 hours/week (from Steve incl. print + e)
 - b) Cat Mgt: 16.8 hours/week (from Maria and Meg)
 - c) Services: 21.2 hours/week (from Everly)
 - d) Total hours: **187 hours/week**

NOTE: The **187** represents number of staff hours spent on journals per week. However, in order to use it in the cost formula it has to be multiplied by number of weeks in the year, then changed into a percentage of all staff hours worked in a year – expressed in decimal form.

(187 x 52 (weeks)) / total hours worked by all HS/HSL staff

$$9,724 / 110,448 = .088$$

NOTE: Total number of HS/HSL staff hours worked in a year figure (110,448) is based on 50 full-time (40 hours/week), 1 part-time (24 hours/week), 5 part-time (20 hours/week) and a 52 week year.

From Betsy Kelly's calculation document:

17) Cost = (journal budget) + (salary budget x % staff time to manage journal collection)

For HS/HSL:

$$\$1,707,673 + (\$2,906,874 \times .088) = \$1,963,478 = \text{Cost figure for journals}$$

CBA for journals is benefit figure divided by cost figure =

$$\$389,241,871 / \$1,963,478 = 20.0 \text{ (CBA ratio for journals is } 20.0 : 1)$$

ROI for journals is ((benefit figure minus cost figure) divided by cost figure) x 100 =

$$((\$39,241,648 - \$1,963,478) / \$1,963,478) \times 100 = 1,899\%$$

18) Total benefits value:

Book benefit figure + journal benefit figure

$$\$10,757,821 + \$39,241,648 = \$49,999,469 = \text{Total combined benefit for books \& journals}$$

19) Total costs:

Book cost figure + journal cost figure

$$\$398,050 + \$1,963,478 = \$2,361,528 = \text{Total combined cost for books \& journals}$$

20) CBA (benefit/cost ratio) total for HS/HSL books & journals combined =

(total combined benefit) divided by (total combined cost)

$$\$49,999,469 / \$2,361,528 = 21.2$$

$$\text{Total HS/HSL CBA for books \& journals} = 21.2 : 1$$

21) ROI (%) total for HS/HSL books & journals combined =

((total combined benefit minus total combined cost) divided by (total combined cost)) x 100

$$((\$49,999,469 - \$2,361,528) / \$2,361,528) \times 100 = 2,017\%$$

APPENDIX 3
NN/LM CBA/ROI Calculator for Databases

Salary Information:	User's Average Annual Salary 1	\$	User Hours Worked Per Year 2		Library Salary Budget 3	\$
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Benefits	Costs	TOTAL Benefit	TOTAL Cost
Database use		\$ 0 9	\$ 0 10
Database sessions or full text articles clicked or tables of contents retrieved or subscriptions represented (use one of these, not all!) 4			
Average retail cost of a single search by a broker OR of a full text article (not both) 5	Library's Cost for Database(s) 6	\$ 0	
User time saved for each search session or article retrieved 7	Portion of all staff time devoted to supporting the database 8	\$ 0	

Clear Form	Total Benefits Value: 0.00 11	Total Costs: 0.00 12
---	---	--

Benefit/Cost Ratio: 0.00 13	ROI %: 0.00 14
---	--

APPENDIX 4

Explanation and Figures Used in CBA/ROI Calculator for *MD Consult* Database

- 1)** User's average annual salary:
\$46,913 (Same as books/journals calculations)
- 2)** User hours worked per year:
2080 (Same as books/journals calculations)
- 3)** Library salary budget:
\$2,906,874 (Same as books/journals calculations)
- 4)** Database sessions:
29,882 (From Robin's database list)

NOTE: Stats for Nov. and Dec. 2007 were unavailable due to a technical problem on the part of the vendor. Therefore, the average monthly use of 2,490 (total use for year of 24,902 divided by 10 months) was added for each month to reflect a more realistic total. The session statistics for Nov. and Dec. of 2008 were 3,262 and 2,635, respectively. Both are higher than the figure used for the two months in 2007, consequently, 29,882 is likely a conservative total.

- 5)** Average HS/HSL literature search fee:
\$20.00 (From Ryan)

NOTE: The opinion of the task force is that the **\$20.00** figure is more "justifiable" than the "average retail cost of a single search by a broker..." suggested by the NN/LM.

- 6)** Cost for *MD Consult* database:
\$34,934 (FY08 cost from Steve)
- 7)** User time saved for each search (in total hours per year):
20 minutes (=0.33 of an hour) (From books/journals calculator)
- 8)** Portion of all staff time devoted to supporting database(s):

- a. Resources: 0.25% of time (from Steve)

Total hours/week: **240** (6 people x 40 hrs/wk)
Total hours/year: **12,480** (240 hrs/wk x 52 wks)
Total Resources hours/year spent: **31.2** (12,480 x .0025)

- b. Patty Hinegardner/Ashley Cuffia: Approx. **12** hours per year

Total hours/year spent managing databases = 31.2 + 12.0 = **43.2**

NOTE: For the calculator, the total hours/year figure needs to be turned into a percentage of all hours worked by HS/HSL staff expressed in decimal form.

$43.2 / 110,448 = .001$ (This is for managing ALL HS/HSL databases)

c. Managing only *MD Consult* database is estimated at 1/5 of .001 or **.0002**

NOTE: *MD Consult* database is somewhat more labor intensive than other databases because of the addition/deletion of new/old editions of books and corresponding URL maintenance.

9) Total benefit:
(# sessions x price/session) + ((user salary/hours/year) x (# sessions x time saved))

$(29,882 \times \$20) + (\$22.55) \times (29,882 \times 0.33)$

$(\$597,640) + (\$22.55 \times 9,861)$

$\$597,640 + \$222,366 = \$820,006 = \text{Benefit figure for MD Consult}$

10) Total cost:
(MD Consult cost) + ((HS/HSL salary budget) x (% staff time to manage))

$\$34,934 + (\$2,906,874 \times .0002)$

$\$34,934 + \$581 = \$35,515 = \text{Cost figure for MD Consult}$

11) Total benefits value: See #9

12) Total costs: See #10

13) CBA:
Benefit / Cost

$\$820,006 / \$35,515 = 23.1$

14) ROI:
((Benefit - Cost) / Cost) x 100
 $((\$820,006 - \$35,515) / \$35,515) \times 100$
 $(\$784,491 / \$35,515) \times 100 = 2,209\%$

APPENDIX 5

List of Databases

Resource		Total FY08	Cost
American Chemical Society CSA	searches	4064	\$37,750
(Sociological Abs, Soc Services Abs)	queries	51080	\$5,565
Current Index to Statistics	** sessions	106	\$270
Ebsco DBS (all)	searches	432526	\$3,951
ISI Journal Citation Reports	queries	6364	\$2,365
ISI Web Of Knowledge	** sessions	14217	\$40,210
Lexicomp	searches	28741	\$3,000
MD Consult	** sessions	24902	\$34,934
NetAnatomy	searches	18038	\$1,495
Ovid Databases	searches	323151	\$34,755
Proquest DBS (Newspaper Collections) \$\$	searches	31379	\$0
ScienceDirect	searches	19347	\$56,782
Scifinder	activities	4149	\$24,800
		958,064	\$245,877
**# of searches n/a			

\$\$ Centrally
funded by
USMAI

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