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The Library as Strategic Investment: Results of the Illinois Return on Investment Study

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Abstract

University administrators are asking library directors to demonstrate their library's value to the institution in easily articulated quantitative terms that focus on outputs rather than on traditionally reported input measures. This paper reports on a study undertaken at the University of Illinois at Urbana-Champaign that sought to measure the return on the university's investment in its library. The study sought to develop a quantitative measure that recognizes the library's value in supporting the university's strategic goals, using grant income generated by faculty using library materials. It also sought to confirm the benefits of using electronic resources and the resulting impact on productivity over a 10-year period. The results of this study, which is believed to be the first of its kind, represent only one piece of the answer to the challenge of representing the university's total return from its investment in its library.

Key Words: academic library assessment; academic libraries; accountability; higher education; return on investment

Background

In 2007, the University Library at the University of Illinois at Urbana-Champaign undertook a study of the return on the university's investment (ROI) in its library. Although it focused on only one component of ROI in

only one large, complex research library, the study marks the beginning of serious ROI research in academic environments and the start of developing useful ways to satisfy increasing calls for accountability and development of useful metrics of a library's value to its university.

Calls for accountability have increased in recent years. In Spring 2006, in response to the expressed needs of academic librarians around the world, Elsevier began discussing the idea of finding a formula that would show a return on a university's investment in its library. The company offered to underwrite a case study, and as a member of Elsevier's North American Library Advisory Board, I had the opportunity to volunteer Illinois for this pilot. Dr. Carol Tenopir (University of Tennessee, Knoxville), a well-known prolific researcher in this area, was engaged as an advisor to the project. Using a standard Request for Proposal process, the team contracted with Judy Luther of Informed Strategies to conduct the research, which began in January 2007. The results of the project represent a strong collaboration among Informed Strategies, Illinois, and Dr. Tenopir. As project funder, Elsevier sat in on discussions and offered advice and support when asked.[1]

Focus of Study

The study's goals were to document quantifiable data that would be meaningful to the university community and to develop a simple methodology that other institutions could replicate. Although the initial goal was to document return on investment in electronic collection materials, lack of reliable longitudinal data compelled the team to focus the study on the university's investments in the totality of the library's services and collections.

Work began in earnest in March 2007 with a discussion with key Illinois administrators to gain an understanding of their perspective. The team had an engaging and insightful conversation with:

- Linda Katehi, Provost and Vice Chancellor for Academic Affairs;
- Charles 'Chip' Zukoski, then Vice Chancellor for Research;
- Robert Easter, Dean of Agriculture, Consumer & Environmental Sciences; and

- Karen Schmidt, then Acting University Librarian and now University Librarian at Illinois Wesleyan.

Dr. Katehi highlighted the administration's five major goals for Illinois:

- focus on new intellectual directions;
- strengthen interdisciplinary work;
- find resources;
- connect with community, state, nation, globally; and
- be efficient in everything we do.

Dr. Zukoski focused attention on the impact of research being done on campus and the importance of the 'fame' that excellent researchers bring to the university. These researchers bring additional competitive extra-mural grant funding, which in turn attracts more excellent researchers and garners more fame for the university. Ultimately, he noted, the university administration is focused on hiring and retaining the right researchers. The library plays an important role in meeting this goal, which at Illinois dates back at least a century, when the university's president determined that building a world class library was the best way to recruit and retain the most excellent faculty members to the university, which sits on the flat prairie amidst the corn and soy fields common to the American Midwest.

The imperative to establish a relationship between the library and the university that could be expressed in quantifiable terms became clear during this discussion, as did the importance of stressing to university administrators that the library be viewed as an asset and not as a cost center or as overhead. From that vantage point, it was determined, the team might be able to formulate the relationship between the library and the grant income generated through its use.

The University of Illinois at Urbana-Champaign (Illinois) is a major research university, whose faculty members are awarded many competitive research grants each year. It has particular strengths in the sciences and engineering. Taking this into account, and considering the values that the university administrators emphasized in the meeting, it became clear that focusing on the relationship between the library and the university's competitive grant funding might offer a basis for determining a formula for a return on investment.

Thus, the team then focused on this question: could a link – an ROI – be demonstrated between successful competitive grant proposals that use library resources and investments in the library? With this question in mind, a team member turned to an Illinois economist to validate the study's methodology. He interpreted the request as the first step in an argument by which the library would seek to 'claim' a percentage of grant funds generated on campus for its own budget. Although he declined to be of assistance, the team learned that it needed to be much clearer in describing what it was trying to accomplish and why.

To avoid any unintended and unnecessary misinterpretations of intent, it is important to understand that this study was:

- *not* a means of claiming a new revenue stream for the library;
- *not* a budget argument;
- *not* a cost/time savings exercise; and
- *not* a predictive model.

Rather, the study aimed to:

- demonstrate that library and its research collections contribute to income-generating activities essential to the campus;
- quantify a return on university's investments in its library;
- highlight the library's role in the externally funded research process; and
- demonstrate 'correlation' between the library and grant activities, rather than attempt to prove 'cause and effect'.

Finally, the team learned to highlight the assumption that it was seeking to conduct *ex post facto* research on data representing recent grant activity on campus, not to develop a predictive model. Its goal was to explore the return on completed investments rather than to suggest that it could predict how much would accrue to the university as the result of future investments.

Constructing the Study

The team began by examining the grants process itself. Although the researchers are of ultimate importance in writing grant proposals, the team understood that the resources offered through the institution are pivotal to their

success. Much of the research process builds on previous work and depends upon access to information that has come before; many granting agencies require citations in their proposals. Most of that knowledge at Illinois is housed in the library.

In the mid-1990s, scientific literature began the transformation from print to electronic formats, and libraries began to invest heavily in e-resources. Illinois' use data, as in other institutions, showed enormous growth in access and downloads of electronic materials and most of those materials are licensed or otherwise made accessible through the library. At Illinois, the majority of books and journals accessed via the campus network through the Library Gateway are licensed by library. The majority of grant proposals at Illinois are in the sciences and the majority of these proposals include citations to papers procured by library investments.

Emerging work had already demonstrated that electronic access enables greater efficiency and productivity for researchers. Work done by Carol Tenopir and Donald King demonstrated the enormous changes experienced in just four years in the early 2000s, once electronic access became more prevalent.[2] Gains in efficiency and productivity by science and engineering researchers, in particular, are in part the result of less time spent gathering information, which allows more time for analysis.

Developing the Model

As noted above, successful grant activity results in new resources being directed to campus by external agencies. It also helps to recruit and retain the very best faculty members. Successful grant proposals typically include substantial discussions of the previous literature. Digital access to the literature facilitates the most efficient use of researchers' time, allowing them to substitute time they would have spent gathering information for time they can spend in analyzing it. Thus, we developed the following argument:

1. Investment in e-resources leads to increased efficiency and productivity among researchers.
2. Increased productivity leads to more grant applications and more scholarly output and citations.

3. Each of these leads, in turn, to more grants awarded to campus, which establishes the environment most conducive to recruiting and retaining excellent faculty, one of the goals articulated in the meeting with university administrators.

Despite the recent interest in studies of library value, searches of the literature did not produce an existing model or one that could be modified easily for the academic environment. Two interesting reports that examined the social and economic benefits of public libraries, both published in 2007, were identified, but neither proved to be adaptable to the university environment: *Worth Their Weight*: *An Assessment of the Evolving Field of Library Valuation*[3] presents an overview of library value assessment methodologies along with summary results from seventeen public library studies. These studies confirmed that by using econometric tools, public libraries can demonstrate a financial benefit, such as the impact of library employment and library spending, to the communities that fund them. *Making Cities Stronger*: *Public Library Contributions to Local Economic Development*[4] positions public libraries as necessary for cities to be stable and competitive in the global information economy. It offered a way of thinking about positioning an academic library as an asset within its institutional community, but it was not directly applicable to this study.

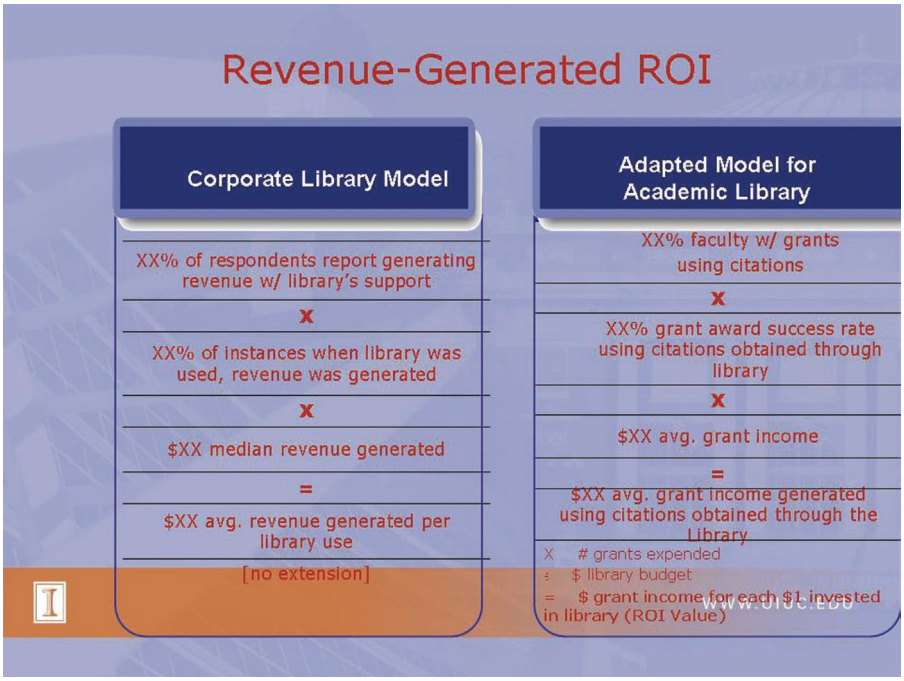
Although *Worth Their Weight* reported on two studies, one in Florida and one in Ohio, which offered ROI calculations, neither of these studies offered what was needed. One calculated ROI based on projected costs of not having libraries. The other used the value of materials that circulated and did not attempt to quantify a value to users of all information provided. Finally, the calculator used such factors as annual local income for the library, cost-to-use alternatives, and lost use, none of which are applicable to academic libraries.

The team also considered other approaches to its study, including statistical analysis, productivity measures, behavioral modeling, and contingent valuation, but concluded that none of these methods would deliver a single ROI figure based on a relatively straightforward calculation. In the end, the team turned to an article by Roger Strouse of Outsell, Inc. and his work on valuing corporate libraries as a starting point for developing its own model.[5]

Strouse demonstrated an approach to the study of value that relied on user survey data and calculated income generated with the use of library

resources. His survey revealed the percentage of respondents who stated that the library played a role in their revenue-generating activities as well as the percentage of those who actually generated revenue using library resources. Using Strouse's formula as its base, the team constructed a parallel model for the academic library environment.

Fig. 1:



To use Strouse's model to calculate an ROI on the library's role in the external grant process, the team turned to identifying the data it needed, which proved to be much more challenging than originally thought. First, it had to make critical decisions about whom to survey. Based on advice from Illinois' Research Office, it included only tenure system faculty, who generate 95% of the grants at the university. Second, it had to identify the longitudinal scope of the study. Although the original intention was for

this to be a 10-year longitudinal study so as to track changes and trends, the team had to abandon that goal when it discovered that the university had one year's worth of 'bad' data (in 2004) owing to the installation of a new tracking system and that it could not identify a decade's worth of reliable usage data. The proposed longitudinal scope of the study also proved unfeasible owing to the limitations of library-related systems, in this case the COUNTER system used to track electronic serials usage. COUNTER was simply too new and its use has not been consistent enough over the past decade to allow gathering appropriate data for all years originally proposed. As both university and library data management systems become more stable and consistent, future studies should be able to be pursued without these limitations.

Finally, the team had to make a critical decision about whether to use the materials budget as the basis of the university's investment, as it originally intended to do, or to use the total library budget. Because library staff and the entire library infrastructure are critical to all aspects of making the collections accessible, using the total budget seemed to be the more prudent course. It was at this point that the team decided to focus its work to identify a single data point: the return on the university's investment in its library as measured by the library's contribution to successful grants garnered in academic year 2006.

User Perceptions of Library Value

On September 12, 2007, 2,083 tenured system campus faculty members were invited via e-mail to participate in an online survey to help evaluate the role that the library plays in their research and grant processes. 328 faculty members (16%), a good representative sample of the Illinois community, responded. They represented a range of academic disciplines as well as a representative distribution of faculty ranks and time on campus.

- Almost 95% responded that references are important, even essential to the grant awards process;
- nearly 75% responded that more than 75% of the references they used in grant proposals were accessed through the library;
- on average, for every citation used, faculty read 4–5 additional items and scanned dozens of abstracts.

While the library has long provided access to a wide variety of materials, the survey demonstrated the impact made by enhanced digital access. More than 80% of respondents identified one or more of the following ways in which digital access has had a positive impact on their work:

- Digital access allows them to dedicate less time to physical visits to the library;
- Digital access allows scholarly information to be better integrated into their research workflow; and
- Digital access and discovery tools allow them to make better use of literature in interdisciplinary and emergent fields of study.

The 300 free-text comments made by respondents have proven to be very useful to library planning and budget requests. These comments included efficiency improvements because of electronic access, including 'Absolutely essential for modern research,' and productivity increases that have 'increased the strength of … grant proposals' because of e-access. This, too, meets one of the university administration's goals of becoming more efficient. Overall, the survey respondents articulated a strong dependency on the library for their research and grant proposal needs.

Calculating the ROI

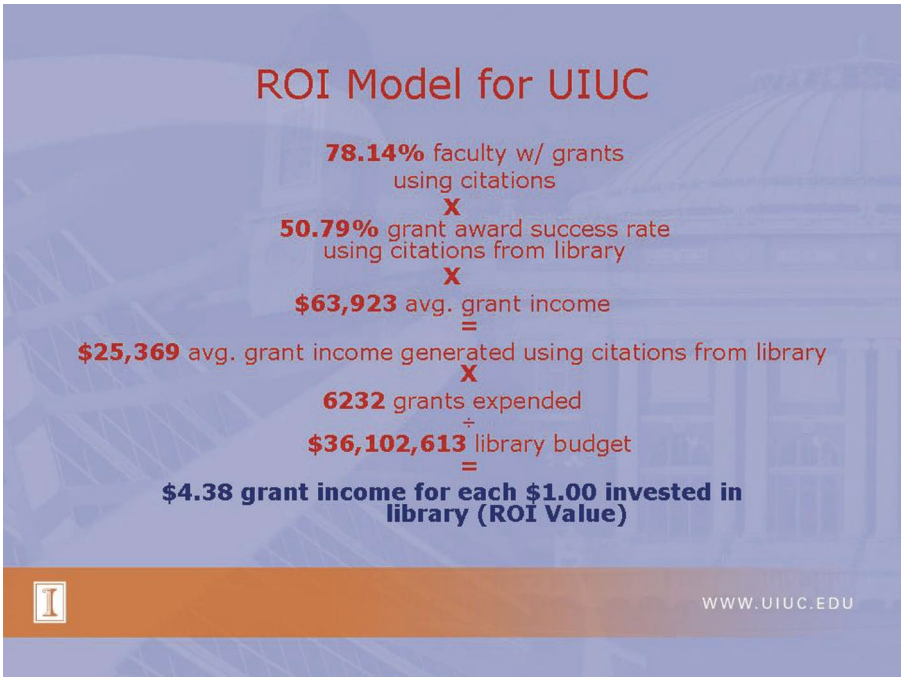
Satisfied with the results of the survey, the team took data collected from all sources and entered them into the ROI calculator, using fiscal year 2006.

The data resulted in the following calculation.

- More than 78% of tenure-system faculty who have grants used citations to the scholarly literature in their proposals.
- Over 50% of grants awarded to the campus came from proposals that included citations to materials accessed through the library.
- The average grant income at Illinois is approximately $64,000.
- Multiply these 3 numbers to calculate the average grant income generated through the use of the library of just over $25,000.

- Multiply this average amount of grant income by the number of grants expended in 2006 at Illinois and divide that by the total library budget to arrive at a return on investment of $4.38 for every dollar invested in the library.

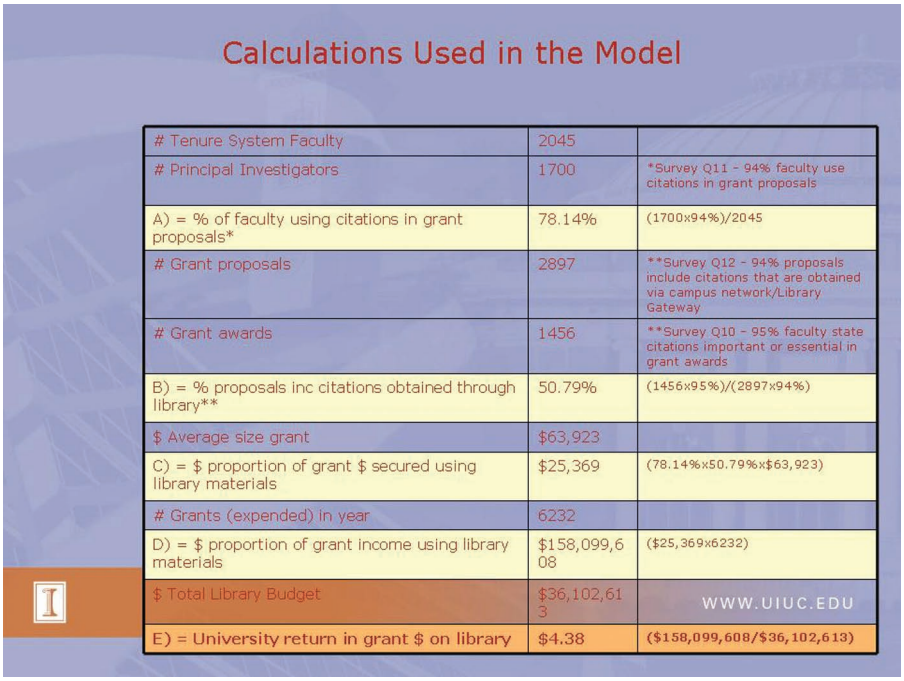
Fig. 2:



Faculty survey results factor into the equation in three separate places. In this way, the model does not assume that all grant proposals use references, it does not assume that that all references come from the library, and it does not assume that citations are deemed critical to all grant proposals. (Detailed calculations can be found in Figure 3.)

It is also worth noting again that the team used the total library budget and not just the library materials budget or the serials budget, in calculating the ROI. This ensures that the model takes into account costs such as

Fig. 3: Appendix



Calculations Used in the Model

# Tenure System Faculty	2045	
# Principal Investigators	1700	*Survey Q11 – 94% faculty use citations in grant proposals
A) = % of faculty using citations in grant proposals*	78.14%	(1700x94%)/2045
# Grant proposals	2897	**Survey Q12 – 94% proposals include citations that are obtained via campus network/Library Gateway
# Grant awards	1456	**Survey Q10 – 95% faculty state citations important or essential in grant awards
B) = % proposals inc citations obtained through library**	50.79%	(1456x95%)/(2897x94%)
$ Average size grant	$63,923	
C) = $ proportion of grant $ secured using library materials	$25,369	(78.14%x50.79%x$63,923)
# Grants (expended) in year	6232	
D) = $ proportion of grant income using library materials	$158,099,608	($25,369x6232)
$ Total Library Budget	$36,102,613	WWW.UIUC.EDU
E) = University return in grant $ on library	$4.38	($158,099,608/$36,102,613)

network infrastructure, personnel, and other library overhead activities that enable electronic access for campus researchers. If the library collections budget had been used as the base, the ROI would have been approximately $12.

Finally, to ensure the validity of this calculation, the team asked Dr. Bruce Kingma of Syracuse University for an independent assessment of the research methodology. In addition to validating the model, Dr. Kingma also provided a number of useful insights about how this study could be expanded by involving other universities, considering other benefits of the library to the institution, and developing a predictive model that might demonstrate what impact additional investments might have on research (or other) activities.

Returning to the initial meeting the team had with university administrators, this study demonstrates the value that investment in the library brings to campus priorities. The survey, especially, suggested the degree to which a strong library contributes to the goal of recruiting and retaining excellent faculty. As one respondent noted, 'I would leave this university in a microsecond if the library deteriorated.'

Next Steps

This study focused only on one university and for only one year. There are several opportunities to learn more about how to calculate a more robust and reliable return on a university's investment in its library.

For example, applying the ROI calculator at multiple institutions would enable us to identify trends and establish benchmarks. Comparative research might also allow us to identify institutional factors, including organizational culture, that contribute to an enhanced ROI.

Other next steps might include expanding the basis for revenue generation by looking at income generated from patents and technology transfers in addition to grant income, developing methodologies for determining the ROI on a library's contributions to more effective teaching and learning, or focusing on the connection an institution has with its community, state, and/or nation. Developing a predictive model will also be an important goal for future work.

Determining the value of the library to its institution is a very complicated problem. This study is just a first step. It focused on the contribution of one library in one institution and only to the grant funding process. It does not address the many broader areas of value. The academic library community has much more work to do. It is likely to take a decade or more to develop methodologies to determine the full return on a university's investment in its library.

Acknowledgement

Thanks must be extended to Dr. Scott Walter, Associate Dean and Associate University Librarian for Services, University of Illinois Library at Urbana-Champaign, who helped edit the essence of this paper for presentations he and I made in Asia, Australia, and New Zealand in Summer 2008.

Notes

[1] A white paper by Judy Luther (2008), *University Investment in the Library: What's the Return? A Case Study at the University of Illinois at Urbana-Champaign*, San Diego, CA: Elsevier, can be found at http://libraryconnect.elsevier.com/whitepapers/0108/lcwp010801.html

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

[3] Imholz, S. and Arns, J.W. (2007) *Worth Their Weight: An Assessment of the Evolving Field of Library Valuation*. Americans for Libraries Council. Retrieved from http://www.actforlibraries.org/pdf/WorthTheirWeight.pdf

[4] Urban Libraries Council (2007 January). *Making Cities Stronger: Public Library Contributions to Local Economic Development*. Retrieved from http://www.urbanlibraries.org/files/making_cities_stronger.pdf

[5] Strouse, R. (2003, March). 'Demonstrating Value and Return on Investment: The Ongoing Imperative,' *Information Outlook*, 14–19.