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Library performance measurement in the digital age

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virtual learning environments, can also make the library's contribution less visible especially to senior institutional managers. Changes in perception of libraries coincide with significant financial pressures on Higher Education Institutions (HEIs), which are likely to become much greater as a result of the global economic downturn. There are also competing pressures on funding within institutions and the library can fare badly if it cannot demonstrate its value. In this environment, libraries must now be able to demonstrate that the investment made in them is worthwhile. They are approaching this in a variety of ways including the use of key performance indicators (KPIs), benchmarking with similar institutions, seeking the views of users, and attempting to assess their impact.

The rapid evolution of libraries in the digital world has been the other major driver for the increased emphasis on evaluation and performance. Rather than relying on subjective impressions, libraries need to develop a robust evidence base to inform internal management decision making and to support the management of change. Increasing sums are being spent by libraries on e-services and the digital infrastructure. Librarians need to know whether this represents good value-for-money as they are often making difficult choices between spending on new e-services and maintaining expenditure on traditional ones. Similarly, innovations need to be evaluated to see whether they meet users' needs and are cost-effective.

What have been the Traditional Measures of Performance?

Academic libraries have had a long tradition of keeping statistics and measuring aspects of their service. The number of books issued each year, number of visits to the library, number of new books or journals acquired, staffing and expenditure figures have traditionally been kept both for internal management purposes and for annual reporting. In the UK, HE libraries complete an annual return to the Society of College, National and University Libraries (SCONUL)¹ for inclusion in their annual library statistics. Similar data collection exercises are conducted by professional organisations in other countries. Two examples, amongst many, are the Association of Research Libraries (ARL)² in the United States and the Council of Australian University Librarians (CAUL)³ in Australia. Such statistics have been valuable in demonstrating trends within the library and illustrating its economy and effectiveness. They continue to form the basis of any data collection. When the emphasis was on collection development, and on an assumption that libraries were unquestionably 'a good thing', these traditional input measures were sufficient. In the new digital environment and in an era of increasing accountability,

1 <http://www.sconul.ac.uk/statistics/>.

2 <http://www.arl.org/stats/annualsurveys/arlstats/>.

3 <http://www.caul.edu.au/stats/>.

new methods of measurement need to be found which reflect the changes taking place.

SCONUL first started collecting statistics from its university library members in 1987. The annual library statistics have been processed by LISU⁴ at Loughborough University since 1995 and their large databank provides a valuable resource for libraries wanting to look at long-term changes and trends. One of the most valuable aspects of the SCONUL annual statistics has always been the ability to benchmark results with others. Most library directors will have used this facility in attempting to make the case for more money, more staff, or more space. Using this resource for trend analysis or for benchmarking has been greatly facilitated over the past few years by the availability of SCONUL statistics on the web, which enables libraries to directly interrogate the data via a web interface, and search and collate data using a range of variables. This includes the ability to compare results with others in the same group (post-1992 universities, Research Libraries UK⁵ members etc.) or with those comparator institutions which the university itself has identified as potential 'competitors'. The availability of a range of consistent and reliable statistics over a long period can give confidence to those libraries that are using them for benchmarking. It also provides an invaluable tool in advocacy at the national level especially where evidence is required to demonstrate the changing nature of HE libraries.

Input measures (such as spending on books or e-books) or activity measures (such as loans or downloads) can rarely give the full picture on their own. Other variables such as full-time equivalent (FTE) staff and student numbers or expenditure figures are needed to produce meaningful ratios, particularly for benchmarking purposes. The SCONUL annual library statistics contain a selection of ratios on library provision and use, stock provision and expenditure, efficiency measures and expenditure ratios. Libraries can use these or adapt them to their own purposes to demonstrate effectiveness, and particularly cost effectiveness, in the running of the library service.

The evolving library digital landscape is leading to a re-evaluation of the statistics that should be collected and analysed. Data on log-ins and occupancy of publicly available PCs in the library are as likely to be as necessary as monitoring of study place occupancy. Libraries need to keep records of enquiries that are received online as well as those handled at an enquiry desk. There may be data to be collected relating to new library services such as number of items in the institutional repository, the number of published articles and chapters scanned, or the number of digital images made available. Libraries also need to measure the availability and use of electronic as well as print resources.

4 <http://www.lboro.ac.uk/departments/dils/lisu/>.

5 <http://www.rluk.ac.uk/>.

What do the Users Think?

With traditional library statistics, we are looking at the effectiveness of the library in terms of its internal management. However, they do not guide us on what the users actually think of the services provided. For this, qualitative data are needed. Libraries have always sought ways to obtain user views, and library surveys have a long history. Some libraries have produced their own, others use or adapt existing templates (e.g. the SCONUL satisfaction survey template), though increasingly now academic libraries worldwide are using LibQUAL+⁶ either annually or every few years. This has the advantage of making it easier to compare results over the years, and to do some benchmarking with other LibQUAL+ libraries, though the benchmarking of qualitative data is much more difficult. These difficulties stem partly from the growth of student expectations of universities and their libraries in the context of them paying higher fees and contributing more towards their education. In the rush to find out users' opinions, there is a danger now that students are subjected to too many surveys, and suffer from survey fatigue. This is leading to more thought being given to what the library will get out of the results of a survey. It is also leading to greater consideration of alternatives to surveys, especially questionnaire surveys, for obtaining the views of service users.

To achieve greater robustness from survey data, more thought is now going into the questions that are asked in any student library survey. Sykes (2009) questions the value of a survey which finds that 70% of students are satisfied or very satisfied, where we do not know what aspects of the service they are satisfied with, and what they regard as important. The LibQUAL+ survey, by asking whether a service is seen as important as well as how it is rated, enables the library to identify the aspects on which they should be focussing. The Customer Value Discovery methodology was used at Nottingham Trent University to see what services and resources customers valued and which were seen as irritants (McKnight and Berrington 2008). The findings led to a number of changes in service delivery and resulted in a marked improvement in student satisfaction survey results. Significantly, library staff have been key stakeholders in this approach and have been involved at every stage in the process. Henwood and Norton (2008) describe the use of Profile Accumulation Technique (PAT) and focus groups at the Wellcome Library to move survey questions away from 'How satisfied are you?' to 'Tell us what matters'.

Putting the customer at the heart of the library service has become increasingly important. Some university libraries in the UK have applied successfully for the Customer Service Excellence Award,⁷ a Government-backed scheme in which university staff and students are interviewed to ensure that the library meets the required level of service in each of five areas (customer insight, culture of the organisation, information and access, delivery and timeliness and quality of

6 <http://www.libqual.org>.

7 <http://www.cse.cabinetoffice.gov.uk/homeCSE.do>.

service). Such awards demonstrate that the library has thought through its service to customers and provides the opportunity for some publicity within the institution itself, all part of the need for greater accountability and for demonstrating the success of the library.

Value and Impact

Statistics can be used to show the efficiency and effectiveness of the service and surveys can demonstrate student satisfaction, but attempts to show the actual value and impact are much more difficult. Output measures or outcomes are now seen as of increasing importance, much more so than the traditional input measures. This was recognised by the SCONUL/LIRG impact initiative, in which 22 university libraries took part. For this, participating libraries identified an area of the service that they wanted to assess, and using an action research methodology, identified the objectives they wanted to achieve and the measures they would use (Payne and Conyers 2005). The approach to impact assessment was developed by David Streatfield and Sharon Markless of Information Management Associates who acted as consultants to the project (Markless and Streatfield 2006; Markless and Streatfield 2008). Using a team approach and selecting practical projects, libraries taking part were introduced to an action research model of impact assessment which would help demonstrate their contribution in a tangible way. Many of the projects related to the use and impact of electronic resources. For example, Glasgow Caledonian University looked at the impact of making available electronic information resources and developing an information literacy strategy (Crawford 2006) and Bournemouth University investigated equality of access to e-resources (Beard et al. 2007). The initial intention of the SCONUL/LIRG impact initiative had been to seek to develop sector-wide impact measures that could be used widely between libraries. Differences in institutional contexts and priorities meant that this was not possible. However, the overall initiative highlighted the importance of seeking to demonstrate the library's contribution to core business processes of the institution especially learning, teaching, or research (Poll and Payne 2006). The focus here is upon looking at real changes in knowledge levels, behaviour, and attitudes. The initiative has also helped to identify methodologies for assessing a library's impact. A variety of different evaluation methods were used in the projects. This included not only traditional research tools such as questionnaire surveys, analysis of existing statistics, focus groups, user diaries, and participant observation, it also included pre- and post-testing of information skills competency levels, analysis of bibliographies to see what resources had been used, and review of students' progress files (Payne 2006).

Attempting to assess the value and impact of the whole service is even more challenging, especially if you want to put a monetary value on it. Return on investment (ROI) is a recognised business technique appropriate for business enterprises, but how can you show the value of the library in these terms? The

British Library study (2004) used a method called Contingent Valuation (CV) to assess its economic impact and from this concluded that for every £1 of public money received by the British Library, £4.40 was generated for the UK economy. A similar attempt to set a monetary value on the library service at the University of Illinois at Urbana-Champaign (Luther 2008) looked at research income in relation to library expenditure. Using the ROI model, this case study used citation and survey evidence to demonstrate that for every dollar invested in the library in 2006 there was a return of \$4.38 in grant income.

In both instances, with interestingly similar results, there was a pressure to come up with a financial statement. Questions such as ‘What return do we get from our investment in the library?’ are increasingly likely to be asked by senior institutional managers in times of budget cuts and answers need to be found, if not in actual money terms at least in terms of value. While it is questionable how far ROI can be used to set a monetary value on the library service, this and similar techniques can certainly be applied in a different way.

Using ‘stories’ or case studies is one good way forward and one that makes use of the web to enliven such traditional publications as the library annual report. Brophy (2008) argues the need for innovative but robust new methods to measure emerging library services. These, he suggests, should be based upon the use of ethnography, externally moderated self-evaluation, and composing narratives to capture the essence of our achievements within their contexts. The British Library provides an example of the use of ‘stories’ from a user and from a member of staff to introduce the web version of its annual report⁸. This is also a method that is much in tune with the way universities themselves are marketing their courses.

Performance Measures

Some libraries have developed service level agreements which describe the services offered and identify the level of service that can be expected. They consequently help to put in context any performance measures. Instead of looking back afterwards, for example at what percentage of inter-library loan requests have been satisfied, the library staff will have discussed and agreed in advance what it is reasonable for users to expect, so they can judge their performance against this standard. Birkbeck, University of London is an example of a library that spells out the services provided to its schools in this way, lists performance levels, and indicates how these performance levels will be monitored. For example, one service standard relates to requests for scanned readings: when requests for digitised readings are submitted two to three months prior to the date required, the readings will be made available at least one week prior to the date required. This standard is then monitored through a check of the status of items on a daily basis. The service level agreement also includes a generic set of KPIs for the library

8 <http://www.bl.uk/about/annual/2008to2009/index.html>.

which covers a range of quantitative and qualitative measures.⁹ These include average number of hours open per week (during termtime and vacation), loans per FTE student, downloads per FTE student, and the percentage of respondents to the library survey satisfied with both the Birkbeck Library and Birkbeck eLibrary.

The Balanced Scorecard (Kaplan and Norton 1992) extends the use of KPIs and takes the process a stage further, by identifying a set of aims before identifying the KPIs that can meet them. This process ties the library service more closely into the institution's own strategic aims. An example of the use of the balanced scorecard within an academic library can be seen on the University of Hull library website.¹⁰

Measuring the e-Environment

The measures described above illustrate how libraries are adapting to the changing environment and recognising the need for greater accountability. What is equally important is to find a way of measuring the use of e-resources that are now taking such a large part of the library budget and influencing so much the way users interact with the library. It is no good maintaining records of traditional library services without setting alongside them evidence of use of the digital library if we are to continue to justify the library's role. SCONUL, through its Working Group on Performance Improvement, keeps a watching brief on all the SCONUL questions and aims to keep pace with change while also maintaining the integrity of the database. The introduction of e-measures questions has been a particular challenge. A set of new questions was introduced in 2003–04 following a pilot project run by Evidence Base¹¹ at Birmingham City University with HEFCE funding. Over the past few years, the number of libraries completing the e-measures questions has grown from 80 in 2003–04 to 110 in 2007–08, but at the same time there has been a recognition that the changing environment means that some of the original questions and guidelines are no longer appropriate. A new set of questions is now being piloted with plans to introduce these in 2010–11. These will include questions on e-journals, databases and e-books, and on numbers, usage and expenditure on each so that a set of performance measures in respect of each category (e.g. cost per use) can be drawn up.

Compared with print resources, the amount of information available on use of e-resources is daunting. Whereas usage of print journals was extremely difficult to capture, use of e-journals can show number of successful article requests, number of turnaways, number of pdf and html views, number of pageviews and more. When the e-measures questions were first introduced by SCONUL there was little

9 <http://www.bbk.ac.uk/lib/about/strategy/servicelevel.pdf>.

10 http://www.hull.ac.uk/lib/using_our_libraries/performance/balanced_scorecard/index.html.

11 www.ebase.bcu.ac.uk.

consistency, and pilot members reported widely different results from different publishers and even from the same publisher at different times. COUNTER is to be congratulated for introducing consistency and reliability into this previously unregulated world.¹² An excellent example of co-operation between the library and publisher communities worldwide, COUNTER was set up in 2002 and has developed a set of usage measures for e-journals, databases and e-books. By December 2009, there were over 100 publishers/vendors who were COUNTER compliant for e-journals and databases and over 25 for e-books and reference works. The Journal Report one (JR1) giving number of successful full-text article requests has become a recognised standard, making counting of use of e-journals much easier and more reliable. The SCONUL annual library statistics for 2007/8 showed 110 million full-text article downloads, compared to 98 million books issued across the UK HE sector, even though only 110 libraries reported on e-journal use compared to 143 giving book issues, an illustration of the importance of collecting full statistics on e-resource use.

As noted above, not all publishers are yet COUNTER compliant, and for databases and e-books in particular there are still significant omissions. New challenges continue to face those trying to introduce order. UKSG's JISCmail list¹³ and the lib-stats list run from Newcastle University¹⁴ both testify to the number of practical problems faced by e-resource librarians and provide excellent fora for discussion among librarians and publishers on an international basis. Another issue is that open access journals are likely to become more widespread and ways will need to be found to measure their usage. The Pirus 2 project is looking at article level use for material in repositories¹⁵. Identifying which articles are being read rather than identifying journal use is likely to be a future expectation. For journals themselves, the Journal Usage Factor¹⁶ now being developed by UKSG is designed to identify which journals are the most used, a statistic to consider alongside the impact factor (IF)¹⁷ which measures the frequency with which articles within a particular journal have been cited within a given period.

Collecting and Analysing Usage Data

While COUNTER has improved the consistency of the usage data, the task of collecting it from each publisher's website is very time consuming. COUNTER's requirement for the adoption of the SUSHI protocol¹⁸ for harvesting the data

12 www.projectcounter.org.

13 lis-e-resources@jiscmail.ac.uk.

14 lib-stats@newcastle.ac.uk.

15 <http://www.cranfieldlibrary.cranfield.ac.uk/pirus2/tiki-index.php>.

16 <http://www.uksg.org/usagefactors>.

17 http://thomsonreuters.com/products_services/science/free/essays/impact_factor/.

18 <http://www.niso.org/workrooms/sushi>.

is likely in the long run to make this process easier, and there are commercial products that also help, but it remains a lengthy process. Baker and Read (2008) in a survey of library directors in US research libraries conducted in 2005 found that the time spent on collecting and analysing ranged from one to over 2,000 hours a year, with a median of 98 hours, with four libraries spending 20–40 hours a week. Any look at the queries raised on the lib-stats and lis-e-resources mailing lists will tend to support this. What is equally significant is that the process of collecting the data left little time for analysing:

Generally, more time was spent on the non-intellectual processes of gathering and preparing vendor-supplied usage data than on the analytical processes that lead to an understanding of an institution's use of its electronic resources. (Baker and Read 2008, p. 52)

The publisher deals project at Evidence Base has worked with libraries on ways to analyse the usage data and produce reports that can be presented to management (Conyers 2007). Developing from this work, plans for a JISC Usage Statistics Portal will provide a one stop shop for getting access to usage statistics and also provide help with their analysis. Initially for NESLi2 deals, it is hoped that this can later be extended to other e-resources. Just having the statistics is not enough. Libraries need to be aware of how e-resources are being used, and most importantly whether they offer good value for money. If a library does not have that evidence to hand when asked 'What value do we get from the library?', they are on rocky ground.

What we do not know from the usage statistics is anything about the users. We may surmise, and anecdotal evidence will surely back this up, that students are making far more use of journal articles now that they are so readily accessible, but evidence on users is hard to come by. Some have tried to match up publisher usage reports with Athens or Shibboleth records or EZ proxy servers. While these can provide useful information, for example on time of day or type of user, any attempt to match them up with publisher usage will be fraught with difficulties. Other libraries record use of e-resources through authentication via their library management systems. This potentially provides greater granularity in the analysis of data. However, the data are unlikely to be COUNTER compliant and may well measure page hits rather than downloads. Others that try to measure usage of e-resources with their own systems experience problems with being able to include accesses which are on-site as they are IP address authenticated rather than requiring separate log-in. Another approach is to monitor hits for gateway pages to their e-resources. However, users who bookmark pages, or access the resources through other routes, will not be included in the counts.

Libraries sometimes use web forms to try to obtain user data on e-resources. However, this risks irritating users unless it is for a short period. It is therefore recommended that a sampling approach to data collection through web forms is adopted. It is also important to be aware when trying to estimate the type of user

that not all will come through the library catalogue or web pages. Users again may have bookmarked a particular journal, or may have come upon it via a search on Google or Google Scholar.

The CIBER group at UCL¹⁹ have used deep log analysis in a study of the information seeking behaviour and use of journals and journal articles by UK academic researchers (Research Information Network 2009). This study has provided valuable insight into usage patterns in different subject areas, searching techniques and value for money which though focussed on the research community has implications also for learning and teaching, with student use of e-journals being estimated at around 20% of total:

It has not been possible to distinguish between use by students and faculty from the publishers' logs on this occasion, but on the basis of published survey findings we believe that use by undergraduate and Masters' students accounts for around 20 percent of the total. (Research Information Network 2009, p. 46)

In a study for JISC Collections (2009) on the national e-books observatory project, CIBER again used a mix of deep log analysis, user surveys and focus groups to explore the use of selected course text e-books by students and produced some important findings on likely future trends in e-book use within a library context.

User surveys have been mentioned earlier, and it must be stressed that the web offers new opportunities to conduct and analyse surveys with minimum effort on the library's part. Though response rates to web surveys such as LibQUAL+ are in general lower than those where more effort has gone into getting in replies, they are still valued for their ease of use and ability to highlight particular issues and trends. They also tend to encourage a larger number of comments when open-ended questions are asked.

Where gate figures showing those entering the library are in some cases going down with more use being made of the virtual library, it would seem sensible to find a metric which parallels the efficiency of the gate counter and looks at use of the library web pages. Google web analytics²⁰ or other web analytics tools are useful means of learning where library website visitors are coming from and which pages they are using. Black (2009), for example, demonstrates how web analytics (or web metrics) can be used to look at user behaviour in relation to timing and duration of visits, how users arrive at the website, the technology that users have, and the most popular content.

In a study commissioned by the British Library and JISC to identify how researchers of the future would access and interact with digital resources, CIBER (2008) looked at the 'Google Generation' or those born after 1993 who had 'little or no recollection of life before the web' but concluded that people of all age groups

19 <http://www.ucl.ac.uk/infostudies/research/ciber/>.

20 http://www.google.com/intl/en_uk/analytics/.

are using the internet and Web 2.0 technology. In an age when we all expect to give our opinions on anything we have bought on Amazon and use the opinions and star ratings given by others when making our buying decisions, or look up a hotel review on TripAdvisor when booking a holiday, it can surely only be a question of time before library catalogues adopt this approach too. Huddersfield University Library²¹ catalogue now offers images of book covers, star ratings and comments. Web 2.0 offers many such opportunities to involve users in library activities. Joint (2009) explores options for the use of Web 2.0 services based on experiences at the University of Strathclyde library and stresses the importance of adopting a Web 2.0 strategy:

Without such an approach, the risk is that your library service will become a jaded and unappealing mausoleum to the web as it was in the mid-1990s – a sort of online Miss Havisham's tea-party that increasingly few users will want to be part of in future. (Joint 2009, p. 174)

While there may be differing opinions as to how libraries themselves should be engaging with social networking sites such as Facebook, MySpace and Twitter, it is certain that Web 2.0 offers opportunities for more interaction with library users that will become increasingly prominent in the future.

Challenges of Measurement in the Electronic Environment

There has always been scope for error in the measurement of library service provision. In the past, traditional library measures have experienced the problem of inconsistent data collection often through the lack of clear definitions or the failure to use systematic methodologies for collecting the data. Similarly, user studies have suffered from poor design, inappropriate methodologies, imprecise question wording, or issues of whether respondents are answering questions accurately. Over time, many of these issues have begun to be addressed as evaluation expertise within the library world has grown and there is a greater appreciation of why these issues are important.

The digital environment has raised new data collection challenges. If we are counting enquiries, how do we handle queries through chat services or database-driven 'Ask a Librarian' services? Even counting the number of electronic resources available can be problematic. In counting the number of e-journals or e-books which we make available, do we include them if they form part of a database? If we provide access routes to open access material, do we count those resources amongst those that we have made available? The blurring of boundaries between the library and other service areas also makes data collection and reporting increasingly difficult. Where a library is part of a converged service

21 <http://webcat.hud.ac.uk/>.

with IT services, or even said to be ‘superconverged’ with other support services, it can be difficult to disaggregate figures relating to use or costs. Where ‘library’ space is shared with other services, the turnstile counts will not be comparable with a library which is not converged. Similarly, a single library and IT help desk may well find it difficult to distinguish between ‘library’ and ‘IT’ enquiries.

There are also challenges in terms of matching measures to the potential audience. Libraries, especially in institutions where there is devolved budgeting, are increasingly being expected to drill down and provide data relating to Schools or Faculties. Schools or Faculties may well want to know about usage of the library by their students and staff. The picture could be seriously distorted without data on their use of e-resources. If a School or a Faculty is contributing to the cost, there may also be a requirement to show that a particular e-book, e-journal, or database is actually used by their students or staff. This information is generally hard to obtain at the level that is required or with the degree of robustness that is expected.

What to Do with the Results?

With such a plethora of evidence to choose from, and so many opportunities for error in the detail, it is perhaps no wonder that many librarians find that the actual task of collecting the evidence is all consuming. Yet, the question ‘what are we doing it for?’ must remain in the forefront. An individual library’s evaluation needs will be influenced partially by the service requirements for assessing efficiency and cost-effectiveness. We increasingly need to know whether services can be delivered more cheaply, to justify the costs of services, and to have an appreciation of best value-for-money in relation to different alternatives. Most academic libraries will also want to put the needs of the customer at the centre of service provision and development. So, increasingly, forward-looking libraries are likely to want to obtain the views of users not just when new services have already been put in place but in their development too. This limits the risk in relation to the investment that is made in new services as they are rolled out. However, although measurement of cost-effectiveness and satisfaction are valuable to us in managing our libraries, there is increasing pressure on libraries to be able also to demonstrate their value and impact.

Having the evidence available is only part of the picture though. The evidence needs to be systematically analysed and reviewed, before being presented to stakeholders. Detailed spreadsheets are unlikely on their own to impress or to increase anyone’s understanding of the value of the library. Whatever statistics have been collected, whatever survey results are available, working out how best to present the results is vital. Actual presentation will depend on the particular audience, whether it be external stakeholders, senior managers, heads of schools, library users, library managers or library colleagues. The amount of detail will vary, but all those receiving information should have confidence in its reliability.

In an age where students are seen as consumers, and the library is far more accountable for its performance and value, presentation of evidence of how the library is performing in the digital age is of vital importance.

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