
Access -the Millennium Fix? The Role and Performance of Document Supply Services within a Higher Education Library.

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The Occasion

The Library and Information Research Group awarded the 1999 Daphne Clark Prize for the research report described in this article.

Abstract

As one of the ongoing University of Liverpool Library developments along the 'hybrid continuum' investigations into the effectiveness, efficiency and economic implications of document delivery services were undertaken. Evaluation and analyses looked at both qualitative and quantitative aspects of the services: both established and new services were reviewed. The evidence from the analyses to date indicates that the 'access versus holdings' debate will continue well into the millennium.

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Research Aims/Objectives

As all academic libraries are only too aware, the escalating cost of journal subscriptions over the last 10 years has intensified the resourcing crisis prevalent within the sector. The rate of scholarly information publication continues to grow: on average an annual 10% rise in STM (Science, Technical and Medical) publications. However, the actual number of subscriptions held by academic libraries falls as a direct consequence of spiralling journal costs. In an attempt to ameliorate the situation locally, the University of Liverpool Library set up a Document Delivery (docdel.) Research Project with the following objectives:

- To investigate the economics of trading ownership for access in order to determine the most cost efficient and effective service balance between the two.
- To investigate and evaluate existing and future document supply services to enable a well constructed and balanced supply base to be established.
- To carry out an on-going scoping study of current research and development projects within this area.
- To propose viable options available to faculties concerning the delivery of information - either via traditional journal holdings or access style document delivery systems.
- To provide information, both to the Library and to Faculty, on the information seeking behaviour of the research community.

Methodology Adopted

The research project comprised five discrete, though complementary, stages. For organizational purposes these may be described as:

- User consultation.
- Background scoping study.
- *Pilot* trials with a range of services.
- Data collection and analyses.
- Post pilot feedback and future developments.

As with all practitioner research based in the tumult of service delivery these components are intrinsically linked and were not always addressed in a strictly sequential fashion.

1. User Consultation

The impetus for the research into document delivery was harnessed between the scientific faculties and the Library as a consequence of an earlier user survey (1996) conducted by Faculty Librarians looking at 'The Use of Computer Based Information Sources and Access to Journal Papers in Engineering and Science: Current and Potential'. One of the significant outcomes of the survey was the commitment and support of the faculties to investigate other means of access to information particularly in regard to alternative delivery methods and the associated underpinning economic models adopted.

A series of *pilot* projects were set up at Liverpool with the collaboration of the scientific faculties (Engineering, Medicine, Science and Veterinary Science) to evaluate a range of document delivery (docdel.) services. Before the *pilot* projects began consultation with faculty members to identify desirable/essential requirements and features from any docdel. service.

To review the overall performance of the services their qualitative aspects were also evaluated. Questionnaires were sent to the *pilot* participants to canvass their views, though informal feedback was forthcoming throughout the lifetime of the project.

1.1 User Survey Methodology: A hardcopy questionnaire was sent via internal mail. As it was a long document it was felt that this was more appropriate than email, particularly as certain members of the user body were neither regular nor proficient users of email. Initially a copy of the survey was to be loaded onto the web, however it was felt that this may restrict survey participation to the more 'IT aware' users.

The survey was sent to all members of the participating departments who were eligible to participate in the *pilot* (as defined by the individual departments - usually academic staff and postdoctorate & postgraduate students). Data from the completed questionnaires were analysed using SPSS. The final survey report was circulated to all participants, the appropriate Faculty Library Committee and the Library management team.

The questionnaire covered five areas:

- Profile of survey respondents
- Respondents' behaviour in accessing original documents - ILL and E-journal usage
- Respondents' views on the pilot trial
- Respondents' perception of services
- Future of docdel. services.

The information collated from the survey provided very useful qualitative data on the specific performances of the services. Criteria evaluated included:

- Access speed
- Interface - ease of use
- Success rate of searching
- Delivery time scales
- Quality of document
- Coverage of database
- Timeliness of data
- Successful delivery rate.

1.2 User Survey Follow Up: The major thrust from the survey was that participants favoured the provision of an unmediated document delivery service: areas of concern were also highlighted.

After the survey a series of semi-structured interviews were undertaken with two specific population profiles:

- A small self-selected group who had indicated on the questionnaire their willingness/wish to discuss matters further. These were all academic staff and postdoctorate students that had tried the docdel. services - not all successfully!
- Heads of the departmental research groups were also consulted. As budget holders for the research activity, this sample would be influential players in any future policy in regard to research support.

The follow up interviews were an attempt to elicit motivations of the research community and to contribute towards the evaluation and decision making process that library management may have to make in regard to the outcomes of the project.

2. Scoping Study

At the onset of the project a scoping study of over 30 services was completed: selection and performance criteria were developed for all aspects of service delivery. Key considerations for inclusion in the *pilot* projects were:

- Access to and utilization of the service did not require either large financial or additional hardware/software investment.
- Monies spent would be in the main for the purchase of articles i.e. cash for articles not blanket subscriptions.
- Services had broad subject coverage of material - a critical mass of titles had to be available.

The selection matrix used in the scoping study also included the following factors:

- Stability and robustness of services - all except one were existing services with proven track records.
- Access to the services from campus currently available.
- Whether services offered alerting aspects that might contribute to perceived added value of access document delivery services over holding hard copy.
- Whether services allowed direct on-line ordering by the user.
- Whether material delivered directly to user.
- Whether there was a linking facility to local holdings.

- How financial transactions were handled.
- The level of management information provision offered by the vendors.

A comprehensive review within each subject area was undertaken evaluating a range of services from various sectors - these included:

- Core multidisciplinary services e.g. BODOS via BIDS, UnCover
- 3rd part aggregator systems e.g. Blackwells Navigator
- Subject specific service e.g. Ei
- Full text ejournal sites available via PSLI e.g. IDEAL
- Niche EDD services e.g. OVID Biomedical Full Text Collection

To satisfy one of the key requirements the subject coverage of each of the services was reviewed in detail. The indicator used was simply the journal titles currently subscribed to and those cancelled since 1995 for each of the faculties. A direct comparison between the journal base of the services and the local faculty lists was undertaken: an evaluation in total of 1,600 titles. It was felt that this was the most manageable approach. The alternative option would have been to collate a comprehensive list of all available journal titles for each subject area, which not only would have been time consuming but ultimately contentious.

Results from this initial study are shown in Table 1.

Table 1: Summary of Subject Coverage in Document Delivery Services

FACULTY	TOP THREE SERVICES		
	1st.	2nd.	3rd.
ENGINEERING (337)	BL inside(88%)	UnCover (79%)	Ei Page 1 (74%)
MEDICINE (449)	BL inside (89%)	UnCover (76%)	ISI via BIDS (49%)
SCIENCE (860)	BL inside (86%)	UnCover (82%)	ISI via BIDs (79%)
VETERINARY SCIENCE (100)	BL inside (82%)	=ISI via BIDS (73%)	=UnCover (73%)

[the number of titles in each of the faculty journal lists is shown in brackets]

The scoping study concluded there was no document delivery service that fully met all the criteria. Compromises in service, performance

levels and the quality of management information provided were made. The services evaluated in the pilot projects are summarised in Table 2.

Table 2: Document Delivery Services Evaluated During Pilot Projects

FACULTY	SERVICES USED in PILOTS				
	BL's inside	Compendex/ Page1 via BIDS/BODOS	Ei Text – Elsevier Eng Inc.	ISI via BIDS and BODOS	UnCover
ENGINEERING	Y	Y	Y	Y	N
MEDICINE	Y	Y	Y	Y	N
SCIENCE	Y	N	N	Y	Y
VETERINARY SCIENCE	Y	N	N	Y	N

The five document delivery services evaluated were similar in their delivery options and their functionality. All are web-based services, with the exception of BODOS, which is available via the telnet version of the databases hosted by Bath Information & Data Services (BIDS). BIDS provides bibliographic services for the UK HE community. UnCover, based in the US, is one of the CARL suite of services. BL inside was a new service launched in 1998 by the British Library.

The depth & range of coverage varied amongst the services, some are subject orientated others are broad multi disciplinary databases. Additional functionality such as Selective Dissemination of Information (SDIs) and ToCs (Table of Contents) emailing features were also available.

All enable the user to interrogate a bibliographic database, identify resources of interest, usually from a citation &/or an abstract. Articles can then be selected and delivered directly to the user by their preferred delivery mechanism. Though the user is notified of the cost of the article there is no financial transactions at the point of delivery. The Library with a predetermined account structure deals with all budgeting & financial transactions.

3. Pilot Trials

3.1 Methodology: The *pilot* project ran within the Faculty of Science during 1997 and 1998. However within the other 3 faculties they commenced in 1998 and are still ongoing. The *pilot* projects were set up to enable each of the faculties and the Library to evaluate document delivery services within a known timeframe and an agreed allocated budget.

During this time the participants were trained in the use of the various services to be evaluated. They then had the option to either use the existing Library ILL service or one of the new document delivery services if they decided to invest some time into learning new skills to utilize the services. No journal cancellations were made at the time of the pilots.

In 1999, due to the success of the pilot project, the Faculty of Science Library Committee decided to cancel additional journals to fund a document delivery service as an alternative to holding the journals in house.

The remaining faculties, Engineering, Medicine and Veterinary Science, are still participating in their respective pilot trials.

Once the services had been selected for evaluation an in-house interface was developed. Web sites were set up for each of the participating faculties. These were password protected private areas for access by *pilot* participants only.

The web sites comprised direct links to the services, full documentation and links to both the library's OPAC and the local electronic journal page. It was essential that any new service developed must be both intuitive and offer some degree of interoperability with other services. Whilst every effort had been made to offer services that offered the facility to link to local holdings information on-line, this had not always proved possible.

An Access database was set up to manage both the audit trail and to facilitate management information provision. Training and documentation were provided for all participants.

To ensure diverse feedback from the research community a mix of participants were selected. Three of the four faculties are based at campus within easy reach of the major journal collections. The exception to this was Veterinary Science; here the participating research group was based offsite about 15 miles from the main site though they do have access to a local journal collection. No barrier mechanism was placed on any of the services to prevent participants ordering locally held articles.

Table 3: Profile of Pilot Projects Participants

FACULTY	No. of Depts.	No. of Partic'nts	Acad. Staff	Post Doctorates	Post Graduates
ENGINEERING	4	12	8	2	2
MEDICINE	3	10	9	1	0
SCIENCE	2	80	60	15	10
VETERINARY SCIENCE	1	7	2	2	3

3.2 Data collection: Though the pilot service front-end was unmediated and the users ordered freely, monitoring of their activity was essential. The collated data would enable informed decisions to be made on any of the specific services as well as on the wider issues of the role of document delivery as a viable component of the hybrid library. To facilitate this monitoring process, the fields of the Access database underpinning the service were:

- order request no.
- date ordered/receipt of articles
- research group/department of requester
- service used
- delivery mechanism used
- journal/publication titles used
- year of publication
- cost of articles

- copyright fee of articles
- publisher
- subscription cost of journal
- impact factor of journal
- whether journal held locally
- number of requests per title

One of the essential prerequisites to the success of the research project was to ensure there was a reliable mechanism in place to record the activity of the participants. It was decided that reliance on reporting by users' on their own activity would not suffice. For some of the services this was already one of the available features i.e. online monitoring of user accounts; however procedures were implemented to ensure an accurate record of all orders was kept.

4. Related Service Analyses

4.1 Library ILL service: To gain an overview of the entire 'access' activity within the Library detailed analyses of the established ILL service pre and during the pilots was monitored. Analyses included:

- Total volume of ILL applications: - time series data was compared looking at changes year on year and any emerging trends due to the docdel. Service were noted.
- Faculty breakdown of ILL applications - including comparison of faculty and collection size and level of ILL activity.
- Departmental breakdown - particularly looking at those departments participating in the docdel pilots.
- Applicant breakdown - by faculty and status of requester.

4.2. LAMDA: Another area of growth within the document delivery arena is that of the consortia collection based service - of which many have developed within the JISC eLib programme. It was felt that it would be useful to evaluate one of these services: any findings would contribute to the overall research process. The University of Liverpool is currently a customer library within the LAMDA (London and Manchester Document Access) scheme and, over a 3 month period in 1997, the service was used as a document supplier.

4.2.1 Methodology: Over a hundred requests were sent to a wide range of LAMDA supply libraries and the progress of the requests was monitored. The requests were selected at random by ILL staff. The LAMDA union catalogue was searched and, when successful, the request was scanned and sent to the appropriate supply site. The qualitative aspects of the service e.g. support, feedback etc. were gauged from experience of using the service.

The data collected included:

- ID Number
- requester status e.g. faculty
- subject area of request using a predefined set of broad subject areas
- whether item found on the LAMDA union list
- reason not on union list e.g. volume or title not held
- date sent and received
- turnaround time

- supply library
- reasons for non supply once request at supply library

Codes were established to define the fate of each request, which enabled ready monitoring and evaluation.

The procedure adopted to send/receive requests was:

- Check for title/volume on the LAMDA union list.
- All requests assigned a running number to help monitor progress.
- If not on union list then the appropriate code was assigned to the request and the details recorded, the request being passed back to the ILL office.
- If successful the supply library code and the shelfmark were handwritten onto the original ILL request form.
- On receipt articles were printed, checked and passed to the ILL office for despatch in the normal manner.
- Request progress monitored and recorded.

When completed the evaluations included:- (A) items not found on the union list, (B) items sent to the supply library but subsequently not supplied and (C) turnaround rates by supply library and subject area.

RESULTS

1. Pilot Trials:

The *pilot* trials in each of the faculties provided some useful data enabling more informed decisions to be made in many areas. The major findings of the trials, at the time of completing the report, were:

1.1. Cost: It was found that there was little discrepancy in the mean cost of articles among the services. The pricing structure of the services is similar - comprising a standard service charge (depending on the delivery option chosen) plus a flexible copyright fee set by individual publishers.

The specific costs of each of the articles were transparent to the participants prior to final commitment to purchase. At any stage they could have decided to use other services, including ILL, if they felt that the cost of the article via one particular docdel. service was too expensive. From the Library's perspective it would be useful if an

alerting mechanism could be developed which would advise docdel. participants that a particular article may be bought more cheaply from an alternative source. Future developments of the service would perhaps include provision of a seamless interface from which users would be able to switch between each of the document supply services.

However it was soon apparent that the participants soon established their service of choice & the intrinsic value they accorded a specific service was not always based on monetary value. High cost articles were usually from the high priced subscription journals & as such the cost benefits associated from access rather than holdings could still be considerable even within this scenario.

This pricing structure leads to wide variations in charges for specific article delivery. Copyright fees vary greatly and this is one area, which has been flagged up as perhaps needing revisiting and further analysis.

1.2 Subject Range: One of the common features exhibited across all faculties was the wide range of material being requested. From completed analysis there have been 1100 requests from 730 different publications, a ratio of nearly three to two i.e. 1.5:1. The number of multiple requests from the same publication was relatively low.

Not surprisingly, there was a high level of ordering from recently cancelled journals up to 33% in some faculties. These statistics reflect the substantive journal cuts that have had to be made across the scientific faculties at the University of Liverpool.

1.3 Service Performance: The popularity of services with the users varied among the faculties. The Faculty of Engineering participants' preferred the Ei Text service (33%). Science Faculty is very much weighted towards the BODOS service, whilst Veterinary Science and Medicine are more evenly balanced between BODOS and BL's inside.

The majority of material being requested is from the last 4 years, over 70% for all faculties.

The major concern of the users, for all faculties, is the quality of the document rather than speed of delivery. Thus for services offering only fax or mail delivery, hardcopy mail is the preferred format. When available, emailing of PDF articles has proved a popular delivery method.

The level of request fulfilment from most services has been high from data to date. Table 4 shows the order satisfaction rates from the services. The success rate of locating articles on the databases was evaluated through the user survey.

Table 4: Document Delivery Service Order Satisfaction Levels (not necessarily within stated time limits)

FACULTY	Overall Rate	BL inside	Ei Text	BODOS via BIDS	UnCover
ENGINEERING	91%	94%	100%	80%	N/A
MEDICINE	90%	95%	N/A	84%	N/A
SCIENCE	89%	93%	N/A	90%	84%
VETERINARY SCIENCE	87%	96%	N/A	77%	N/A

2. Library ILL Service:

2.1 Total Volume of ILL Applications: For the 1997/98 session there was an overall rise of 5% in the level of ILL applications as compared to the

previous session(see Table 5). Medicine and Science continue to be the major players, 33% and 27% respectively.

Table 5: Volume and Trend of ILL Applications from 1989-1998

	89/90	90/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98
Applications	19526	10383	13156	15196	15726	14672	18716	16971	17814
% of 89/90	100	53	67	78	81	75	96	87	91
% change year on year		-47	+27	+16	+3	-7	+28	-9	+5

Table 6: Comparison of Faculty Breakdown Session 96/97 and 97/98

YEAR	ARTS	ENGIN.	LAW	MEDICINE	SCIENCE	SES	VETSC.
97/98 TOTAL	1248	1490	377	6569	3416	1491	514
96/97 TOTAL	1180	1574	304	5489	3818	1499	664
%	+6%	-5%	+24%	+20%	-11%	-1%	-23%

Key: ENGIN: Faculty of Engineering
SES: Faculty of Social & Environmental Studies

2.2 Document Delivery Participant Departmental Breakdown:

2.2.1 Science: In the 97/98 session the Faculty of Science ILL activity declined by 11%.

Departmental activity within the Science was very similar to that of last year with School of Biological Sciences (SoBS), Psychology and Chemistry the major players.

SoBS activity declined by a third. However, during this period SOBS *pilot* participants generated 468 requests for the 9 month period (Nov 97-July 98) when the pilot docdel trial was live. If we were to assume that these orders would have been channelled to ILL if the *pilot* had not been in operation, then the SoBS activity would have increased from the previous session by 2%.

The remaining scientific departments either recorded a drop in ILL activity or a marginal increase.

2.2.2 Engineering: The Faculty of Engineering reported an overall fall of 5% in ILL activity. However it is much more difficult to monitor or even comment convincingly on any consequence(s) docdel. activity may have had on the level of ILL requests - primarily because the level of docdel. activity was limited to a handful (12) of specific interdepartmental participants. The statistical significance of any change in activity by such a small group of users is debatable. Within the time frame 197 docdel. requests were generated - which, if directed towards the ILL service, would have increased the level of activity by 7%.

2.2.3 Veterinary Science: Veterinary Science ILL activity fell by 23% from the previous session. The actual volume fell by 150 requests; the number of docdel. orders made in that period was small and certainly not statistically significant on the ILL trend.

2.2.4 Medicine: ILL activity rose by 20%.

However, in the given period, there was little docdel. activity within the Faculty, as Medicine only commenced participation late in the session.

3. LAMDA:

Overall the performance of the LAMDA service was good for those requests that were sent, although the low satisfaction level was of concern. 'Pros' and 'cons' can be summarised as follows:

Pros:

- The support office service and backup was reliable and helpful.
- Reported problems were dealt with quickly by supply libraries.
- Low unit cost - £3.60 (at time of research; from 10/99 £4.20)
- Reliable quick response times: 67% of requests were received within the advertised 48hrs - one of the benchmarks of the LAMDA service.

Cons:

- The low request fill rate (see Table 7) - 58% of requests not supplied (42% completed) of which almost half not supplied because title not held on union list
- Checking of union list easy but labour intensive.
- Entire operation, on average, took 10 minutes of staff time per item.
 - This compares unfavourably to staff time spent on handling ILL items. The requirement to search the LAMDA union catalogue & then annotate requests with the specific shelf locations is the time consuming element in the LAMDA process.

Table 7: Fill Rate of LAMDA Requests by Subject Area

Subject Area	% Supplied Requests	% of Failed Requests
Arts	25%	75%
Biomedicine	50%	50%
Business	100%	0%
Dentistry	50%	50%
Education	75%	25%
Engineering	75%	25%
Env'l Sciences	43%	57%
Geology	100%	0%
LIS	100%	0%
Medicine - Clin'l	37%	63%
Nursing	0%	100%
Psychology	50%	50%
Science	61%	39%

CONCLUSIONS

The information gained from the completed work to date has provided considerable insight into the information seeking habits of a section of the academic community. The data has begun to be utilized in a number of areas, many of which are ongoing areas of development.

The detailed data collected has enabled a cost benefit analysis exercise to be completed. This in turn facilitated a more informed feasibility study of potential holdings/access economic models to be made within the local situation. Work is still ongoing in this area and the findings will hopefully be published at a later date.

The project also conclusively demonstrated the wide range of material consulted within a single department - thus highlighting the ever growing chasm between the demand and expectations of the user community and the in-house resources that any academic library can reasonably provide within a value for money environment. A review of the material requested will contribute to collection development decisions in participating departments. Realistically the hybrid library must be a distributed library service.

Another equally valuable outcome of the project was that it continued to foster good collaborative working relations with the faculties in a proactive manner. Mutual problems have been addressed to the benefit of both the Library and the faculties concerned.

As would be expected in this very dynamic area the initial objectives and parameters of the research project were modified in an attempt to ensure that the methodologies kept pace of the current issues in the wider information arena. As new docdel. services have come online these too are being evaluated. This continuing fluidity of the market place has substantive resource implications for effective service delivery. Training, monitoring, evaluation etc. have all real costs associated with them and these need to be factored into any pragmatic cost analysis of the wider 'access scenario'.

The work to date has demonstrated that document delivery cannot be viewed as an isolated service but is part of the suite of services that the developing resource centre that the University of Liverpool Library will have to offer to its diverse and disparate clientele.

Document delivery *per se* is being offered more and more as an option from the providers of fulltext electronic journals and bibliographic databases. Access to the fulltext is available to subscribers free at the point of provision and to non-subscribers on a 'pay as you view' transactional basis. To cater for these developments alternative economic models need to be developed both from the administrative and support aspects. Ongoing work continues into many of these areas addressing some of the complex issues that currently abound within the entire holdings/access debate.

As we approach the millennium it is clear that access strategies are no quick fix to the demands and challenges of providing an effective, efficient value for money academic library service. Achieving a balanced, cost effective mix of services and resources within the hybrid library is indeed a challenge. All that may be conclusively said, if I may paraphrase Dylan(1964), is 'that times are a changing' and with them so too must the strategies that the academic library community adopts to keep pace in this brave new world.

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