World Library and Information Congress: 69th IFLA General Conference and Council

1-9 August 2003, Berlin

Code Number: 036-E
Meeting: 111. Document Delivery and Interlending & Cataloguing
Simultaneous Interpretation: Yes

DOCUMENT DELIVERY DESIGN: SYSTEMS FOR USERS, NOT USERS FOR SYSTEMS

Peter Stubley
Assistant Director for Academic Services
University of Sheffield Library
Sheffield, UK

ABSTRACT:

Based around the Feasibility Study into a National Union Catalogue for the UK (UKNUC) and input into the investigation of the future of union catalogues in Denmark, this paper suggests some of the 'background' issues that need consideration in the design of document delivery systems. It is not intended to address the full range of issues in modern document delivery systems and does not, for example, discuss implementation of the ISO-ILL standard. Rather, it emphasises that care should be taken to ensure that software design does not override a consideration of user needs. Results are presented from the UKNUC survey of user requirements, comparisons between physical and virtual union catalogue architectures are made and the recently published report of the UK Research Support Libraries Group is cited as it impacts on these topics.

INTRODUCTION

This paper is based around the work that was undertaken during the Feasibility Study into a National Union Catalogue for the UK (Stubley, Bull and Kidd, 2001a) which, although almost two years old, still holds relevance in the current climate. The Feasibility Study considered basic architectural models for a UK National Union Catalogue (UKNUC) and, while the range of services that could be derived from such a resource were enumerated (including inter-library loans (ILL)/document delivery), the time available for the Study did not allow these services to be explored in any detail.

In spite of this, the methodology undertaken in the Feasibility Study and the lessons learned have a direct relevance to a consideration of the design of document delivery systems, not least because the user was placed at the centre of the Study. Unless this happens in document delivery design, any system developed from a purely architectural and technical standpoint runs the risk of failure.

Following the UKNUC Study, the author was invited to be one of four external evaluators of plans for the future of union catalogues in Denmark and, while the focus was primarily on the architectural models of catalogues (Working Group on Future Union Catalogue Functions in Denmark, 2002), a consideration of ILL functionality played a part. The author is grateful to the Danish National Library Authority for agreeing to allow elements from his evaluation document (Stubley, 2002) to be included in this current paper.

The paper begins with a consideration of the key issues in the ILL/document delivery transaction. This is then viewed through the perspective of user needs and an overview of testing undertaken in the UKNUC Feasibility Study of virtual versus physical catalogue architectures: unless catalogues can be used with confidence in the accuracy of their search results they fall down yet again from the user perspective. The conclusions draw these sections together.

It is emphasised that the paper is not intended to review the full range of issues in modern document delivery systems and does not, for example, include a substantive discussion of the ISO-ILL standard.

KEY ISSUES

The following are the key issues to be considered when looking at the design of a document delivery and ILL system:

- confirmation of the existence of an item
- accurate known locations for an item
- availability at those known locations
- timeframe for user need
- licensing controls and authorisation.

The relative importance of these issues might vary between the conventional (paper) and electronic environments.

Confirmation of existence of an item

From the user's point of view an item of interest can appear in any number of ways from a detailed literature search through mention in a journal paper to serendipitous almost accidental discovery. Some of these ways will incorporate full – or at least part – bibliographical details but the very nature of exploration means that users frequently seek papers, books or other items where bibliographic information is sparse or virtually non-existent. In manual systems users are not penalised for their lack of knowledge – inter-library loan forms are accepted with the barest details and librarians attempt to confirm the existence

of items – and it is important that automated systems offer similarly open-ended requests. In other words, users *might* be enabled to search a national union catalogue or bibliography as a step in identifying items of interest but they must not be limited to identifying an item in a system before being enabled to make an ILL request for it. Any system must provide a blank form which the user can complete with only the barest of known details before submitting it to the library.

This argument should not be interpreted as confirming that large-scale bibliographies or catalogues should only be the province of the librarian. There are undoubtedly many occasions when the expertise of library staff (together with professional tools oriented to the librarian) is still needed to locate obscure items but in an increasingly open electronic environment users must be given the opportunity of exploring as many sources for themselves as possible. The type of access needed by users becomes important here, as does the accuracy and ease of use of any search engines utilised; both are discussed later.

Accurate known locations for an item

This might be viewed as a special case of the previous issue, particularly where large-scale catalogues form a major component in confirming the existence of items. The same arguments apply but the accuracy of search results and ease of searching relate here less to the bibliographical details and specifically to location information: without this, and without it being accurately provided in an up-to-date manner, the interloan process falls apart. In union catalogue terms, this in turn depends on the membership of libraries in a particular city, region, country or subject or functional grouping. In other words, how comprehensive is a national (or regional) union catalogue? Does it exclude important libraries with unique collections? Is it cross-sectoral, covering public, academic and special libraries?

Associated with the accuracy of known locations is the idea of searching gradually outwards from one's own library, in concentric circles, on the understanding that a location closer to home is better than one further away. Such an arrangement is discussed briefly from the user-needs perspective later in the paper but, while there may be organisational, co-operative or library reasons for such an arrangement they would appear to primarily relate to past rather than current practice. Certainly in the UK, long-standing co-operative library arrangements were established around a range of city or regional services, presumably on the understanding that proximity improved service. However, as postal services have improved and mail order, particularly via internet retailers such as Amazon, has improved in reliability and become virtually second-nature, so the idea of ILL working in concentric circles must be challenged: certainly the location of a particular item is completely unimportant to a user: in many cases delivery might be quicker from afar. At the same time, it is accepted that co-operative arrangements put in place locally might incorporate financial incentives which encourage the local sharing of resources.

A further element in terms of location, which may prove important depending on the way in which ILL is organized in particular libraries, is the actual (site, branch, etc.) location within each library which might be entered on a union catalogue in simply broad, system, terms, e.g. naming a university library when there could be 10 separate locations.

Availability at those known locations

Knowing the location is not, of course, the end of the story for the item being requested might be unavailable for a range of reasons: on loan to another borrower; in a loan category not available to external borrowers; reference only; at binding; or lost and not yet indicated as such on the catalogue record. While all these are valid and understandable reasons – from a library perspective – why the ILL cannot be satisfied, they are unsatisfactory reasons to a user who might have gained expectations about the availability of the item in question from their own catalogue search. To improve services in an open-access environment in which users can see the potential for ILL, it would be advisable to incorporate some link to circulation data – explicitly or implicitly – to enable library staff and users alike to form a realistic idea of the delivery time of items.

Timeframe for user need

This needs little further explanation but ensuring that items are delivered in time clearly requires an accurate and quick search mechanism and an indication of item availability from the requested library or libraries.

Licensing controls and authorization

Where document delivery or ILL involves traditional paper materials the regulations are clearly defined (one copy, for use in private study, etc.). However, as document delivery in the future will move towards electronic supply, there are significant licensing and authorization implications which need to be addressed. The Final Report of the (UK) Research Support Libraries Group (2003) is discussed at the end of this paper but paragraph 114 from the Report is worth quoting in this context:

> The sharing of sensitive or legitimately restricted data, and of materials licensed to a limited user group, demands sophisticated access management technology for the authorisation and authentication of users. Since the information will be distributed, there will be significant issues of legal, technical and financial management that will need to be addressed by the systems and libraries hosting the content.

USER NEEDS

The UKNUC user survey

In the UKNUC Feasibility Study, a wide consultation exercise was undertaken to determine how a National Union Catalogue might be used, what functions it could perform and, from a review of other systems world-wide, which technologies were appropriate in a modern setting. Two large-scale postal surveys were undertaken, one of academic staff, postgraduates and researchers, the other of librarians; and meetings were held with staff from 35 ‘key players’ – commercial, academic or other organisations – in the UK, continental Europe and North America.

The aim of the questionnaire survey aimed at library users was to collect data on their information needs and assess, by asking questions on potential facilities and services, how successful the UKNUC might be in satisfying them. From a survey of the literature, it did not appear that much practical research of this nature has been carried out previously in the UK, or indeed elsewhere.

The users were chosen from academic staff, researchers and postgraduate research students across UK higher education because it was felt that they represented a pro-active group with experience of searching library catalogues borne out of wide-ranging and demanding information requirements, substantial knowledge of differing information resources and related library services such as interloans. For these reasons it was argued that they would be in a position to contribute in an informed way to the discussions.

The questionnaire survey was wide-ranging, asking about current uses of library catalogues and other information sources together with the features these academics would like to see in any national system. Full details can be found in Stubley and Kidd (2002) but of particular interest in a document delivery context were the answers to questions about characteristics of a national union catalogue and the preferred methods for consulting items found in a search.

Characteristics of a union catalogue

User interface

In the question, 'Which of the following characteristics would be of most importance to you?' ten options were listed and two characteristics came out as clear favourites: a user-friendly interface; and comprehensiveness. No further work was undertaken on this aspect – as this was simply a Feasibility Study – but, as the channel through which the user receives his or her experience of the national union catalogue, interface design is clearly a matter of importance, particularly when viewed in the context of some systems which appear to pre-suppose the holding of an information studies degree on the part of most users.

In the work undertaken into the future of union catalogues in Denmark, it was similarly stressed that 'the pivotal point is the user' and their interaction with the system via the user interface (Andresen, 2002): a web bureau has been employed to ensure that the user interface to their internet-based bibliotek.dk was appropriate for widespread public use. It will be interesting to see whether, as use of the Danish National Union Catalogue increases, there becomes a need to incorporate more 'sophisticated' features into the user interface: many internet search engines and the search interfaces of services like Amazon.com include an advanced mode for experienced users.

In the context of the user interface, the presentation of results is clearly important. One of the difficulties – in any union catalogue model – is the handling of multiple copies of the same title held in different libraries and these issues are further complicated by the multiple imprints of the same edition (for fiction, in particular) and the appearance of new editions. Work on clusters in physical catalogues can begin to resolve these difficult issues and are being address in Denmark (Andresen, 2002) and in COPAC in the UK (Cousins, 1999).

The display of results should be transparent to end users and not have to be accompanied by long explanations or excuses. Thus, it would be difficult to explain to users familiar with searching databases or using internet search engines, that when searching a virtual union catalogue not all results will be received at once. The type of end user for whom union catalogues should be designed – the naïve end user – will expect the same type of virtually immediate (and complete) response that they receive when using their own library OPAC, the database of Amazon.com or an internet search engine.

The problems with accuracy of search results in distributed catalogues are dealt with in the comparison of physical and virtual catalogue architectures, below. This is a particularly important issue because users will in most instances accept without question the accuracy of the results, even when those results do not tell the whole truth. Of course, the importance of this accuracy to the user can vary depending on the nature of the search.

Comprehensiveness

Comprehensiveness came high in UKNUC survey needs. In other words, users wanted to be sure that when they were searching, they were searching all libraries. They did not want a part-union catalogue which would require searching in different places at different times.

A related issue is whether users have any preference for searching the whole or just a part of a union catalogue. When this question was asked, well over half the respondents said they would prefer to search a single database although the greatest support was received for 'selecting libraries with strong collections in your subject area'; there was some support for selecting a subject area in association with a geographical area. However, this would suggest that there is a belief that small, subject-specific, catalogues will produce quicker, more relevant results. With good database and search engine design this does not have to be the case although as a result of these findings a single large-scale database might want to offer ways of narrowing search results through the application of a number of variables.

Another key issue for management of the resource is participation. A 'comprehensive' catalogue means not only that everyone has to participate but that all core areas – departments, sections, branches – in all libraries must participate. And what incentives might be offered, or be required, to encourage/ensure participation?

Importance of document delivery to users

In emphasising the importance of the user, Danish thinking links the results of a search into access to the item itself, particularly through the process of inter-library loan. Similarly, in the UKNUC survey, academics did not see citation details as an end result of the search and there was overwhelming support for obtaining items identified in a union catalogue by ILL.

On the other hand, although visits to libraries in the same city were acknowledged as necessary on occasion, academics indicated that they were not prepared to travel outside of these boundaries – within the county or region, certainly not to another major conurbation – to view holdings. In the UK, academic staff have so many demands on their time – keeping abreast of research; teaching; bidding for research grants; involvement in administrative activities; writing papers and books – that they cannot afford the time to travel to consult

documents. This is coupled with a UK transport system that appears to be close to breaking point for much of the time and acts as a further disincentive against travel.

As already stated in this paper, the emphasis on inter-library loan and the findings that UK academics are unwilling to travel to consult material brings into question the 'concentric circles' approach to resource discovery and document delivery. In cases where a well-defined structure for interlibrary co-operation exists, searching gradually, for example, by county public library, regional public library, to a national public library might make organizational sense. Such service scenarios for interloans were made during UKNUC discussions and are present in the Danish documentation. However, it can be argued that if academics – or, more widely, library users as a whole – are unwilling to travel and invariably utilise ILL, then the sourcing library is unimportant. Postage is – in general – so reliable that whether a loan is sourced from within the same city or from the other side of the country is immaterial and will in most instances have no effect on the end user. However, it is recognised that 'opening up' the system in this way, removing the hierarchical approach, might be difficult or challenging where a systematic approach is based on historical or well-established local or regional agreements.

Summary of user needs

In summary, the key issues for users, and which should be taken into consideration in evaluating union catalogue architectures for document delivery, are:

- comprehensiveness of the catalogue;
- user interface design, including de-duplication, transparency and accuracy of results;
- access to the actual item (e.g. book, journal article) is more important than the union catalogue search itself;
- questions need to be raised about the importance currently attached to the sourcing library.

PHYSICAL VERSUS VIRTUAL CATALOGUE ARCHITECTURES

In an attempt to bring an objective perspective to bear on the discussion of physical versus virtual union catalogue models in the UK a comparison was made between the two. This has been published by Stubley, Bull and Kidd (2001b) and, surprisingly, appeared to be the first time that an objective comparison had been made; it was hoped that, through publication of the results, others might follow to enable a more widespread discussion to take place based on evidence from user-based needs. The systems compared were the physical union catalogue of COPAC and three virtual catalogues funded as part of the UK Electronic Libraries Programme (eLib) as investigatory projects: CAIRNS; M25 Link; and RIDING. COPAC http://www.copac.ac.uk provides free, unlimited access to the merged online catalogues of members of the (UK-only) Consortium of University Research Libraries; CAIRNS http://cairns.lib.gla.ac.uk is a virtual union catalogue of Scottish libraries; M25 Link http://www.M25lib.ac.uk/M25Link/ is the virtual union catalogue of London academic libraries; and RIDING http://www.riding.ac.uk is the virtual union catalogue based around Yorkshire academic libraries.

In reviewing the two models, comparisons were made of user interfaces, de-duplication, handling of result sets, bibliographic data and record supply, holdings and circulation data, and performance. Tests were conducted using various combinations of author and title search on both catalogue models and the results showed that the lack of precision in the search results returned from the virtual union catalogues and the lack of uniformity in Z39.50 server response from different library suppliers were particularly notable. Comments supporting these findings were similarly made by the Working Group on Future Union Catalogue Functions in Denmark (2002).

In the UK, it was hoped that the accuracy of results would improve as a result of take-up of the Bath Profile by system suppliers but this has happened at a significantly slower rate than originally anticipated. Currently, there appears to be little incentive for suppliers to adopt the Bath Profile, possibly because the Profile itself is seen to be changing, possibly because of a seemingly multitude of different profiles from different countries or interested parties: suppliers will not dedicate resource to implementation until there is wide and stable agreement.

Mirroring the search difficulties with Z39.50 search are those associated with holdings and circulation data. The Z39.50 implementors' community has recognised the need to improve holdings information and a Holdings Schema was published in January 2000. While important, this has received less publicity than the Bath Profile and the number of implementations worldwide is small: certainly none of the systems tested showed evidence of supporting this. What the tests did show is tremendous variability, both in the location of holdings information within the MARC records and the detail provided. Circulation data – though coming within the ambit of the Holdings Schema – showed even less standardisation. Practices that might be considered satisfactory at the local or even regional level become difficult to manage when used in a national service and there would appear to be little agreement on the timescale in which these holdings issues will be resolved, though holdings elements do also form a part of the Bath Profile.

In these circumstances, it should be noted that, although physical union catalogues do not normally include circulation data on account of its transient nature, COPAC (the CURL OPAC in the UK) http://www.copac.ac.uk provides links to individual library management systems to enable availability checks to be made once a particular item of interest has been identified. This, of course, reduces the amount of data retrieved – and certainly the bulk retrieval of data – from local systems to a minimum.

The Working Group on Future Union Catalogue Functions in Denmark (2002) wished to implement a system in which records from 'more than one source containing the same title could be matched and presented in a combined form so the result appears practical and rational to the user'. However, from the testing undertaken in the UKNUC Study, this ideal is some years away in virtual catalogues. The Z39.50 Sort function was supported by only half the suppliers in the UKNUC tests which meant that sorting of results had to rely on Gateway functionality, this in turn being applied in a batch manner to those records that had been retrieved up to a certain time; to apply a full sort would require waiting until all records had been delivered to the Gateway, a process which is very difficult to explain to users familiar with internet search engines that appear to delivery results instantaneously.

Small libraries in the UK were also recognised as having particular characteristics that make it difficult for them to participate in virtual systems, e.g. a lack of staff who cannot provide the necessary level of technical support, and library management systems that do not have associated Z39.50 targets or (see later) ISO-ILL systems.

Since the UKNUC Study a further investigation is underway to look at the feasibility of inter-linking between a very large physical union catalogue (COPAC) and a large virtual union catalogue (M25 Link). A number of issues will be included in the investigation such as comparative speed of searching, de-duplication, results ranking and also comparing the accuracy both of the records themselves and the results. Known as CC-interop, the project began on 1 May 2002 and will run for two years; lead institution is the London School of Economics and Political Science and further information can be obtained at: http://ccinterop.cdlr.strath.ac.uk/index.html.

Summary of a comparison of catalogue architectures

Virtual union catalogues have their supporters and the technology can appear impressive on the surface level. However, at the present time, there are substantial drawbacks with this approach and serious doubts about its accuracy of search, presentation of results. This is still a developing technology that is not mature enough to form the backbone of a national service with the implications of reliability and quality that this implies. Attractive savings might appear to be offered in this scenario by bypassing the current problems of updating the physical union catalogue. However, if a large number of libraries – particularly small libraries – cannot provide Z39.50-compliant targets or purchase library systems whose Z39.50 targets have substantial local IT-overheads, these libraries will be excluded from any national network and the updating difficulty will simply be replaced by incomplete database coverage.

TAKING DOCUMENT DELIVERY DESIGN FORWARD

The impact of change

New technology is regularly seen as a two-edged sword, bringing with it exciting new developments while at the same time offering challenges to existing techniques. So it is when considering automated document delivery/ILL systems but other factors impacting on us are cultural change, and the rate of uptake of the technology. Cultural change might be seen to have a significant impact, particularly where this is associated with moves to a freer and more open society. Whereas in the past the librarian could – and did – get away with designing systems that could be understood only by information professionals, this is no longer seen as acceptable. The facilities in ISO-ILL (outlined below) which permit tracking allow the user to monitor progress of his or her request, suggesting where delays have occurred in the supply chain; such systems should give rise to improved services. But, in the spirit of increased openness and transparency, the user should now also have ready and unfettered access to some of the search tools of the information professional, in particular to those large-scale, national union catalogues which have previously been a mystery to all but a select few. It is from this perspective that this paper has been derived.

The design of regional or – hopefully – national document delivery networks will always be a balance between the incorporation of new (or the latest?) technology with economic, strategic, organisational and political factors as these are judged to effect the case in hand. For example, in Denmark, the investigation into the future of union catalogues reviewed the relationship between document delivery and catalogue architecture and recommended that the existing physical catalogue model should be continued. This was supported by all external evaluators. However, for ILL services it was accepted that a fully centralized system will not – by the very nature of technological developments – be sustainable in isolation. The realistic scenario is that a central union catalogue should continue to support centralized interlibrary lending but that it will not be the only solution; it must be designed to work with local or regional models – sometimes virtual models – which have their own ILL arrangements, and which must also interoperate with the central resource.

In the UK, while there have been discussions on the closer working relationship of the various document delivery suppliers, no decision has been forthcoming on how these might work more closely together. A series of meetings of all those involved in ILL services was initiated by the British Library under the title 'Making the Links' and ran for 12 months from June 2000. In these wide-ranging discussions a number of feelings were expressed about the state of ILL in the UK, in particular that:

- Placing an interlibrary loan request is more complex than ever;
- there are a wide range of billing and charging regimes;
- the ISO-ILL protocol could play an important role in allowing different systems to link together but only a few systems support it.

Change and ISO-ILL

It is not the aim of this paper to look in detail at ISO-ILL but some mention is needed, particularly in relation to the rate of change. ISO-ILL is the frequently adopted shorthand for referring to the ISO standard for the Open Systems Interconnection Interlibrary Loan protocol (ISO 10160/1). It comprises the suite of ILL application standards that have been designed to allow the interconnection of computer systems from different manufacturers. In addition, the protocol provides support for the control and management of ILL transactions for both lending and borrowing activities. There are three individual standards in the suite of ILL application standards:

- ISO 10160:1997 – ISO-ILL Service definition
- ISO 10161-1:1997 ISO-ILL Protocol specification – Part 1
- ISO 10161-1:1997 ISO-ILL Protocol specification – Part 2

As an open, international standard it offers – in theory, at least – the key advantage over existing supplier, region, or nation-based systems that it will provide automated, managed, access to completely world-wide distributed ILLs; instead of relying on membership of an ILL club – however efficient and reliable – ILLs should be obtainable from anywhere. In particular, the standard offers automatic messaging for all ILL processes and tracking at each stage, providing feedback on the progress of requests; automatic routing of requests is also possible.

Although on the increase, relatively few products currently exist based on ISO-ILL and the use of ISO-ILL with/without Z39.50 continues to pose a dilemma for implementors, who are faced with the choice of the Z39.50/ILL profiles or the IPIG profile where ISO-ILL is used without Z39.50 as a carrier. The NISO Circulation Interchange Protocol can also play a part and is seen, among other things, as a bridging mechanism between ISO-ILL and local library management systems. In the UK, the protocol is being used in some co-operatives on a regional basis and the British Library is now accepting requests via its ARTISO ISO-ILL-based service. The drawback in any regional or large-scale implementation is ensuring uptake of this new technology by all members, something that they might have little control over if ISO-ILL has not been implemented by their library management system supplier. Any planning for the implementation of new or revised ILL arrangements in a region or country must allow for the fact that some libraries – particularly those in small institutions – will not have access to the technology for some considerable time and may have to rely on alternative arrangements.

After the UKNUC Feasibility Study

In the UK in recent years, a number of initiatives have developed advanced perceptions about the role of information services, particulary as these are applied in higher education. The Electronic Libraries Programme (eLib) funded a wide range of projects and was followed by the Research Support Libraries Programme: http://www.rslp.ac.uk. This started in the academic year 1999–2000 and finished on 31 July 2002, with funding totalling almost £30m awarded during the lifetime of the Programme; it had the overarching vision of facilitating the best possible arrangements for research support in UK libraries and was one of the co-funders of the UKNUC Study. A number of projects supported by these programmes focused on document delivery or included document delivery elements.

Following this, the Research Support Libraries Group was established by the four UK higher education funding councils, the British Library and the national libraries of Scotland and Wales in 2001 to make recommendations for a UK-wide strategic framework and co-ordinated delivery mechanisms for research information provision. The Group was chaired by Sir Brian Follett. The Final Report of the Research Support Libraries Group was made available in early 2003.

As far as this current paper is concerned, the Final Report of the Research Support Libraries Group (2003) indicates a number of ways forward in the linked area of national union catalogues and document delivery. For example, it noted that the British Library and CURL have begun a feasibility study into monograph interlending and also recognised the pre-eminence of the British Library as a repository of research resources. The Report recommends "that ways should be found to ensure the continuing financial viability of the British Library's document supply and inter-lending services".

In reviewing the current arrangements in the UK for the discovery of printed materials, the Research Support Libraries Group concluded that these were 'inadequate' and gave cause for concern, particularly as 'materials in hard copy will form an important part of the information resource for most researchers for many years to come … it is not satisfactory that researchers

should find it so difficult to identify what is available and where this is located' (paragraphs 91–92). The following actions are recommended to address these points:

- develop a comprehensive and detailed national catalogue of serials holdings, SUNCAT (Burnett, 2003);
- undertake further collection mapping and collection assessment;
- develop a national union catalogue of printed resources, identified as a priority among the researcher community.

IN CONCLUSION

In both Denmark and the UK, similar initiatives in recent years have given rise to a consideration of the structure of document delivery systems but both have taken place in a wider context of strategic requirements and, most particularly, from the perspective of the user. Catalogue architectures are important and, as this paper has indicated, physical and virtual models have their supporters and detractors, both offering advantages. As the technology develops and as systems continue to be implemented for the primary benefit of individual institutions so it will be difficult to impose one solution. The Danish work recognises that at some point virtual and physical systems will need to communicate with each other and further work is being undertaken in the UK on this matter. But all of this will be of little use if we do not take into account the needs of our users.

REFERENCES

Andresen, Leif (2002). library.dk: integration of national and local library services. Presented at *ELAG*, Rome, 18 April.

Burnett, Peter (2003). SUNCAT: a serials union catalogue for the United Kingdom. To be presented at *IFLA*, Berlin, 6 August 2003.

Cousins, S. (1999). Virtual OPACs versus union database: two models of union catalogue provision. *Electronic Library*, vol. 17, no. 2, pp. 97–103.

Research Support Libraries Group (2003). *Final Report*. HEFCE. Available from: http://www.rslg.ac.uk/

Stubley, Peter (2002). *The future of union catalogues in Denmark: evaluator's report*. Available at: http://www.bs.dk/index.ihtml (follow English link, then "Future Union Catalogues in Denmark".

Stubley, Peter, Bull, Rob and Kidd, Tony (2001a). *Feasibility study for a National Union Catalogue: final report*. Available at: http://www.uknuc.shef.ac.uk/.

Stubley, Peter, Bull, Rob and Kidd, Tony (2001b). The UK National Union Catalogue: Feasibility Study. Part 2: observations and user testing of physical and virtual models. *New review of information and library research*, vol. 7, pp. 27–46.

Stubley, Peter and Kidd, Tony (2002). Questionnaire surveys to discover academic staff and library staff perceptions of a National Union Catalogue. *Journal of documentation*, vol. 58, no. 6, pp. 611–648.

Working Group on Future Union Catalogue Functions in Denmark (2002). *Union catalogues – scenarios for data distribution*. Danish National Library Authority. Available at: http://www.bs.dk/index.ihtml (follow English link, then "Future Union Catalogues in Denmark".