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Resource Sharing for the Future  
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# Effective and automated handling of end user requests in Danish National Union catalogue

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## Abstract

This paper presents the implementation of completely automated end user initiated Inter Library Loan in the Danish Union Catalogue bibliotek.dk/DanBib. This automation builds on an already established infrastructure where the end user through bibliotek.dk has access to and can order all material available in the Danish libraries, regardless of who owns it. The introduction of bibliotek.dk in 2000, and the extensive use of it in the Danish population, has caused a huge amount of extra work in the libraries. This paper describes how we have worked on automating the manual processes involved in the handling of these user requests from bibliotek.dk. It also gives an overview of the issues that had to be dealt with and the requirements for implementing this automated system. Finally it presents the results of the introduction of the automated system so far, as the system has been running since the end of May 2007.

## Introduction

Since the year 2000, the Danish population has had access to searching and requesting the material held by all Danish libraries (academic, special and university libraries as well as public libraries) through bibliotek.dk (<http://bibliotek.dk>). Judging by the number of users and number of requests performed, it has been a huge success.

But for the libraries, which are the suppliers of material and manpower for fulfilling the requests, the first years with bibliotek.dk have been somewhat cumbersome. Because the library users actually do request books and other library materials! In 2006 2.2 million loan requests were made through bibliotek.dk. The user of bibliotek.dk just requests the material. He does not have to bother with which library possesses the material. If it is held in his local library, he is directed to the record in the local OPAC, and he can place his request there. But if his library does not hold it, the library staff – until recently – handled the request more or less manually.

Over the past years the focus of bibliotek.dk has been on:

- Effectiveness in handling requests from end users by
  - having the system perform automated ILL-requests, replacing the manual handling of the these
  - placing the request at the library that can and will deliver the material first
  - basing everything on the use of z39.50-standards for searching, retrieving, holdings information and automated ILL-ordering.
- Ease of use for end users, e.g. through the use of FRBR-like display and requesting facilities.
- Effectiveness in delivery of library material, e.g. through the establishment of a nationwide transportation service.
- Local influence and agreement: the entire system is based on the contribution of the local libraries, their systems and employees. The local libraries keep control of local ILL-policy through the editing of settings and parameters for the ILL-functions in the central system.

In a paper presented at the 9<sup>th</sup> IFLA Interlending and Document Supply International Conference in Tallinn, September 2005, we described the automation of ILL-requests among Danish library systems, based on ILL-services for holdings information and ILL-services (request, answer) exchanged between the DanBib system (the national union catalogue) and the local library systems using the z39.50-protocol. See Petersen 2005.

Since the autumn of 2005, we have been working on the automation of end user loan requests from bibliotek.dk to the users library. We launched the first version of this in the beginning of May 2007, after running a test version since the autumn of 2006. In this paper we report the results from this initial period of running the service.

### **bibliotek.dk and DanBib**

The Danish union catalogue is built up around the two bibliographical databases:

- DanBib – for the library professional
- bibliotek.dk – for the end user

They both contain the full Danish national bibliography plus records and holdings information from all Danish libraries (university libraries, academic and research libraries and public libraries). Both systems provide holdings information and request-services; the requests in DanBib are inter library loan requests between libraries. The requests from bibliotek.dk are requests from end users for items found in bibliotek.dk.

If the user finds an item that is held by his local library, he is directed to the record in the local OPAC where he can place his request. So requests through bibliotek.dk to the local library are mostly for material that is NOT held by the local library; thus potential ILL-requests. These requests are presented to the local library staff through a web interface to the BoB-database (database of loan requests), from where they have all, until now, been handled manually by library staff.

In the BoB-database the requested item is presented with holdings information from the DanBib

Union catalogue. Direct links to the ordered record in all the local library web catalogues of the possessing libraries are presented. In this way the library employee can check dynamic holdings and circulation status. There are links to ordering directly in DanBib. The library employee can therefore handle a DanBib-ILL-request with a few mouse-clicks, preserving all information about the end user, retrieving holdings request from Z39.50-libraries etc.

## Why automate?

But of course: as many of these loan requests end up as real ILL-requests through this (usually rather trivial) manual process, the idea came that these activities could be done automatically:

1. Finding the libraries that have the item
2. Finding out who can deliver within the time limit specified by the end user
3. Turning the loan request into an ILL-request to the lending library

## Major issues with automation

When we discussed these issues with library professionals they often expressed a wish and a will to automate these manually handled requests. But - there's always a "but"! To many library professionals, the mere thought of automatically turning bibliotek.dk requests into ILL-requests entirely unmediated, was worrisome – there were problems to consider. And though the technique of automating requests from bibliotek.dk was clear to us from the beginning<sup>1</sup>, a lot of political issues had to be discussed and solved:

1. Edition: The local library might hold another edition of the requested material. The end user might be satisfied with this edition. But, as the records are MARC records covering only one edition of the requested work, the user might have requested another edition described in another MARC record in the database.
2. Type of material: Some libraries might want to decide whether they want to send ILL-requests for specific types of material that they normally do not request for their end users.
3. New items: Most libraries would prefer not to send (mediated or un-mediated) ILL-requests on brand new material that has not yet been purchased by the library itself, but is held in one or two libraries who have been quick to report holdings to the union catalogue. They use the incoming requests from end users as input to acquiring the material.
4. Restricted-ILL-policy: Some libraries (e.g. small university institute libraries) only lend out to other libraries in special cases, e.g. if they are the only library that holds the item. Most requesting libraries would not want requests to these libraries to be sent automatically.

These issues had to be handled by the system if the libraries were to support the effort and benefit from the automation-project.

Issues 2-4 are treated collectively as "the policy problem" in the following.

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<sup>1</sup> In short: z39.50-holdings request to the holding libraries from the holdings-request-answers choosing the library that can deliver first and sending a DanBib-ill-request to this library.

### Solving the edition-problem: work display and ordering in bibliotek.dk

The bibliographic records in the DanBib and bibliotek.dk databases are catalogued according to rules based on the Anglo American Catalogue Rules (AACR2) in a MARC version (danMARC2) used in Danish libraries. All records represent editions.

This meant that libraries could get bibliotek.dk requests from users in the BoB-database on an item that the library was holding in another edition. But as the user had chosen another record in the result set, he was never aware of that. Both the library and often the user prefer that the library's own material is requested before sending ILL-requests – and no one wants to request material from other libraries if the user would be satisfied with lending another edition of the same work in the local library if this is immediately available.

Therefore we have implemented a *work* display and work request in bibliotek.dk. The idea is:

- To give the users a more user-friendly interface.
- To give the users required items faster.
- A reduction of unnecessary inter library loans, as we can now match the holdings of all the editions of a work and lead the user to the local library catalogue if his own library has any of these editions.



Your search: **forfatter=jenkins og titel=churchill og sprog=engelsk** [New search >](#)

[Refine search >](#) [?](#) [RSS](#) [?](#) [?](#) [Try search in Google - choose](#) [v](#)

5 records, matching your search was found [Did you mean something else? See other suggestions >](#)

[Sort by:](#) Year [v](#) [?](#) [Sort >](#)

**Jenkins, Roy Churchill**  
Sprog: Engelsk  
Emne: politikere ; England ; 1900-1999

[Request book regardless of edition >](#)  
See where the item is available >  
Look up availability at Favourite libraries: >

 BOG: Pan, 2002 • 2 libraries • [Show full record...](#)

 BOG: 3. printing. Macmillan, 2001 • 5 libraries • [A](#) [Show full record...](#)  
[Show all 3 editions](#)

[Request audio book \(cd\) >](#)  
See where the item is available >

 LYDBOG (CD): (Ved John Sessions) Abridged. MacMillan, 2001 • 1 library • [Details...](#)

In the example above you can see the display of Roy Jenkins' biography of sir Winston Churchill. It is in the database in three different editions/manifestations. As a default, we present data from two editions in the first display – with a link to a presentation of all editions (Show all 3 editions).

To the right you find the *Request regardless of edition*-button. If the user submits a request using this, he is led to his local library if it holds any of the three editions. And, it is only if his library has no holding at all that he will be able to submit a bibliotek.dk request. In this case

the system chooses the edition with the highest number of holdings to be requested. And – with automated ILL-request – that is the record that will be requested automatically.

But of course: if the user wants a special edition (e.g. recorded music with certain artists, and not just any recording) you can expand to the manifestations through the Show full record links, and then you will get a request button for each edition of the work.

This way of displaying records is inspired by the IFLA Functional requirements for Bibliographical Records (FRBR). The FRBR is a model of analyzing bibliographical records according to their content. The definitions operate on four levels:

1. a work: a distinct intellectual or artistic creation
2. an expression: intellectual or artistic realization of a work
3. a manifestation: physical embodiment of an expression of a work (“edition”)
4. an item: a single exemplar of a manifestation

Bibliographic records in library catalogues (registered according to the AACR2-rules), normally describe the title on the manifestation level. That is also the case in Danish library catalogues, including DanBib and bibliotek.dk. We have not changed this when implementing work-display in bibliotek.dk; the work level display is based on matching, and collocating, manifestation records on the fly, before the system presents the result set to the user. This match is based on simple author and title data in normalized form.

As you can see from the example from bibliotek.dk our definition of *work* differs from the official FRBR: we consider expressions in different language to be different ‘works’. This is for practical reasons: we do not believe that our Danish users will be indifferent to the language of the material they request. In fact, we are quite sure they will not! You could also say that we prefer grouping according to the *expression* of the work.

The implementation of FRBR-like work-display in bibliotek.dk was introduced in 2005 and the *Request regardless of edition* was introduced in December 2006. It has been a success as regards the number of linking to the local library catalogues. In January-February 2006 the number of linking to the local library catalogues were approximately 50% of all requests. The year before the percentage was approximately 33%. So from point of view of the local libraries it has been a success. And, as such, an important precondition for the acceptance of automated ILL.

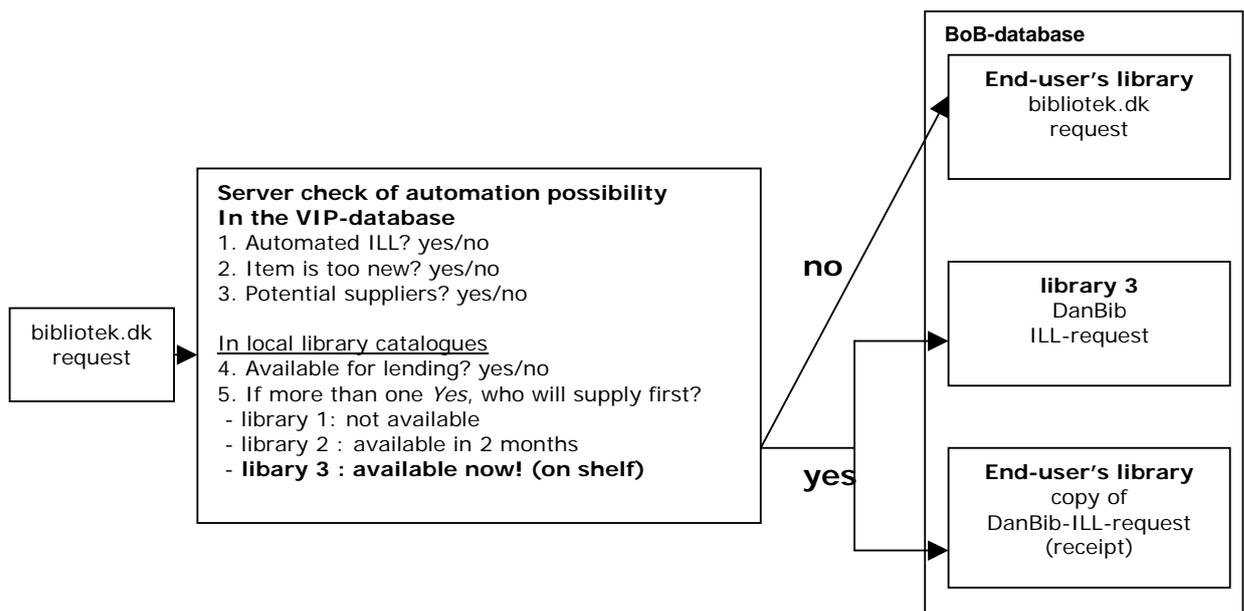
## Solving the policy issues

A feasibility study of implementing the automated ILL dealt with the policy issues. Library professionals from all types of libraries participated in this study. This effort resulted in the following principles and parameters for automating end user requests from bibliotek.dk:

- Mutual accept from both requesting and responding libraries: the system only tries to automate the request if the requesting library has accepted automated ILL-requests; and the responding library will only receive such a request if it has accepted to receive automated ILL-requests from requesting libraries.
- It is not either/or automation: the libraries specify the parameters for each type of material that can be automated. These types of material are: books in Danish, books

- in foreign languages, audio books, recorded music, printed music, video/DVD's, CD/DVD-ROM's .
- Both requesting and responding libraries specify for each material type:
    - Will they send/receive automated requests for each type of material.
    - A deferred period - in number of days - for each type of material (the item must not be newer than xx days). This means: All records in the database have a date of publication. To automate the request the “age” of the item (processed from the publication date) *must* be of more days than the deferred period of both the requesting and the responding libraries (not only one of them). Otherwise the request is not automated – because the item is not “old enough”.
  - The requesting libraries specify which libraries they want to send automated requests to. They can either choose *All possible responders* or make a list from those libraries that accept automated requests.

### Model of automated ILL-requests from bibliotek.dk



### How it works today – automating ILL-ordering of bibliotek.dk requests

The principles mentioned in the previous section, we were able to express as machine-readable parameters in a database. Each participating library set these parameters as both requesting library (sending automated ILL-requests) and responding library (receiving automated ILL-requests). For this purpose they use a web-interface to a database that the libraries already use and are familiar with using in connection to bibliotek.dk and DanBib: the VIP-database. This database contains directory information about the local libraries as well as settings and parameters regarding their interaction with the DanBib and bibliotek.dk systems.

The users do not notice the difference between automated and non-automated requests in the user interface. As a bibliotek.dk-user you just have to concentrate on finding what you want in the result sets and requesting it at your local library. If your local library holds the material, you make the request in their OPAC, if not, you fill in the request form in bibliotek.dk. All the work with processing the request and deciding whether to automate or not is done in the back end.

When the user has submitted the request it goes through a lot of evaluations before it is turned into an automated ILL-request:

- Does the user's own library accept automated ILL-requests for this type of material?
- is there - among the holding libraries - any library that is willing to receive automated ILL-requests for this type of material?
- Is the material old enough for automation for the requesting library?
- And for the possible lending libraries?

The answers to these questions are found in the libraries' parameters in the VIP-database. If the answer to either of these questions is *No*, the request is not automated. It is then sent to the user's own library as an ordinary bibliotek.dk request. The library staff has to look it up in the BoB-database and handle it manually, as previously.

If the answers to these preliminary questions are *Yes*, the request is a candidate for automation, and the following happens:

- The system makes a z39.50 holdings request to the possible lending libraries (10 at a time).
- A lending library is then found among the libraries that answer that they can and will supply the material.
- If more than one of the holding libraries can supply immediately, the lender will be the library with the highest priority in the requesting library's preferred-lender-list<sup>2</sup>.
- If no library can supply immediately, the lender will be the library with the first expected date of delivery (this date is a part of the holdings data), provided that the expected date of delivery is before the expiry-date set by the end user.

If a lending library is found, the initial bibliotek.dk request from the end user to his local library is now converted into a real ILL-request. The end user's library is the requesting library, and the responding library being the library with the highest priority in the requesting library's preferred-lender-list that will supply the material first, either immediately or after making a reservation (hold-placed).

If none of the holding libraries can, or will, deliver the material, or they cannot fulfil the request before the expiry-date of the request, the request is not automated. Instead it is sent to the local library's BoB-database as a bibliotek.dk request to be handled manually.

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<sup>2</sup> Also managed through the VIP-database.

## Technical requirements of the local library system

*For the requesting libraries:*<sup>3</sup> no special requirements! They do not have to acquire new library systems or modules or anything. They only have to fill in the parameters in the VIP-database.

As requesting library they can choose between two options for each type of material in the VIP-database: *Test* or *Operate*. When the *Test*-option is set the requests are not automatically sent as ILL-requests; they are all sent to the local library as ordinary bibliotek.dk requests. But a note in the request informs the library staff about the result of the automation evaluation: this request would have been sent to this particular library (if they had chosen *Operate*) – or it would not have been automated, and the reason why (e.g. the item is not old enough).

If the library fills in the parameters and chooses the *Operate*-option the requests will be automated if possible. The automated DanBib requests will then have a requester note telling that this request was an automated ILL-request. And if not, the library staff will see notes in the bibliotek.dk requests explaining why they were not automated.

*For the responding library*<sup>4</sup> there is one important technical requirement: they must be able to respond to a holdings request sent to them via z39.50. A profile for this is described and documented by the Danish National Library Authority in the danZIG-profile (profile for use of z39.50 in Danish libraries) (Andresen & Jørgensen, 2006). This profile is widely adopted by vendors of library systems in Denmark, and its implementation in the local library systems and in the DanBib and bibliotek.dk systems has been a precondition for the automation of ILL in Danish libraries in general. A special feature of the danZIG-profile is that all ILL-messages (including display of holdings information) are sent in XML-format. The format for holdings display is based on the ZIG holdings scheme.

See our 2005-IFLA ILDS contribution for details about z39.50 and the danZIG profile for holdings information and ILL-ordering (Petersen, 2005).

## The results so far – some figures

In June 2007 the system processed 40% of all the bibliotek.dk-initiated requests as automated ILL-requests. This percentage has increasing slowly every week. In week 29 (end of July) 53 % of the bibliotek.dk requests ended up as automated ILL-requests.

96 libraries have chosen the *Operate*-option as **requesting library** for Danish books, 13 are still running the *Test*-option. Among these libraries are nearly all the public libraries.

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<sup>3</sup> The requesting library: when the library receives requests from end users of bibliotek.dk and sends automated ILL-requests to other libraries

<sup>4</sup> The responding library: when the library accepts to receive automated generated ILL-requests from the requesting libraries



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150 libraries are **receiving** automated ILL-requests from requesting libraries. Among these are all the public libraries and a lot of university- and research- libraries with legacy obligations to contribute to the ILL service.

But at present (at the end of July 2007) the system still is very new and is still being tested, examined and discussed among library professionals in Denmark – the number of both lenders and borrowers will probably increase in the autumn. In our presentation at 10<sup>th</sup> IFLA ILDS Conference we will give an update of these results, and look into detail how it works for a single typical Danish library.

### Further developments

We have already received several ideas for further developments of the system. We plan a revised version that will be ready in the beginning of 2008. Among new facilities could be:

- More types of material: in this first version of the system we cannot automate requests if one bibliographical record covers several volumes in the local libraries lending administration system (first of all: periodical issues).
- An option: only automate if the material is immediately available (no place-holds/reservations to be made). Some libraries have claimed that they want to decide where to put place-holds and that they are only interested in automated ILL if the material is on-shelf in the lending library.
- An option: automation even if the material is held in one's own library: some libraries want the possibility of processing an automated ILL if their own material is not immediately available. Until now it has *not* been usual in Danish libraries to inter-lend material that is held in their own collection but is not on the shelf. But this attitude is changing, and some libraries want the automated system to facilitate this new option.

### Conclusion

The bibliotek.dk-service in Denmark has been a great success from the opening in late 2000. Users search and order library material, and the number of searches and requests have increased every year since the opening. The users were (and are) happy – but the library professionals were confronted with a lot of extra and unexpected work as the number of requests increased.

Our contribution from the DanBib and bibliotek.dk systems to ease that burden has been automation. We started in 2005 with the automation and support for automation of the ILL-requests performed through the professional DanBib-system. Now with the automation of the end user initiated bibliotek.dk requests we have made a new contribution to the hard working library professionals all over the country: they can now let the system take care of all the “trivial” bibliotek.dk requests and concentrate on the requests that really need mediation.

But let us not forget the end users. They will now, in many cases, get what they need faster as the processing of the resulting ILL-requests is now performed automatically and immediately as they make their request – not one or two days later.



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