PICA's integrated infrastructure for document ordering and online document access

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Introduction

Over the last three years an infrastructure is being developed which facilitates an integrated approach to end-user initiated Inter Library Loan (Document Ordering) and online access to documents in electronic form.

This infrastructure is exclusively aimed at the end-user and will allow document ordering and document access from the end-users workdesk using WWW-browsers as end-user client software.

The ultimate goal is to provide end-users with the required documents on their workdesk for both electronic documents as well as for paper document, the latter being temporarily converted into electronic form.

The facilities are built on top of the existing Inter Library Loan (ILL) system which has been operational in the Netherlands since 1983.

ILL components

In traditional ILL several components can be identified which over the last few years have been gradually enhanced with end-user oriented functions, as follows:
**Item identification**

- the central Union Catalogue
- central Online Content Database for Journal Articles
- local library catalogues
- external links

**Request handling**

- Open Library Network ordering facility
- central menu-client ordering facility
- direct ordering by library staff
- central ILL facility with routing algorithms
- manual handling of requests by supplying library
- links between ILL and local circulation control
- international forwarding of requests

**Document delivery**

- Traditional mail delivery
- Ariel Document WorkStations
- Document Delivery Servers
- international EDIL relay

These components are described in further detail below.

**Item identification**

Item identification usually takes place as a result of searching a catalogue. Users have two access points:
The central Union Catalogue

The central Union Catalogue for ILL is based on the central cataloguing database where cooperating libraries build a shared database of title descriptions. All libraries that participate in ILL add their holdings to the records. All titles that are marked as 'available for ILL' together form the Union Catalogue. The central Online Content database contains the content information, since the end of 1993, for about 12,000 scientific journals. The Online Content database is linked to the Union Catalogue so that holding information for individual journal articles in the OLC-database is directly available. Access to these databases can be realised through two routes.

Library staff will use the PC client package, IBW, to directly access the central system.

End-users can either access the central Union Catalogue through the central Menu-Client, providing VT100 menu-driven access, either via a direct connection over SURFnet or via the Libraries Local system through the Open Library Network function. In addition PICA has realized a WWW-interface for accessing both the Union Catalogue and the Online Content database. End-users can access from their workdesk the PICA WWW-server (http://www.pica.nl) and can, if they have personal authorization or if their library has a license arrangement with PICA, directly access the PICA provided databases on the basis of sophisticated hyperlinks.

The local library catalogue and the Open Library Network (OBN)

On the local level, all titles that are owned by the library are available in the online public access catalogue. These local library catalogues can be linked through the facilities of the Open Library Network (OBN) which is fully operational in the Netherlands. Through this facility, items held in other libraries can be identified through direct links between libraries.

In the second half of 1995 PICA aims to realize a WWW-interface for accessing the local OPAC in a similar fashion to the central PICA-databases, thus providing a fully
integrated WWW-environment for catalogue searching through the Open Library Network.

External links
In several projects, searching links between PICA systems and external systems have been established, or are under development. Examples are the DBV-OSI II project and the ION project. Also, links with OCLC and RLG in the U.S. are currently operational through the central PICA system in Leiden.

Ordering
When an item has been identified through searching, ordering can take place depending on the search mechanism which has been used.

OBN requests
If identification takes place by an end-user through the services of OBN, a LOAN command will cause a request to be formulated on the local system. This request is first matched against the local database and issued as a local loan request if the item is owned by the library itself. If it is not found locally, the request is uploaded to the central system where it is handled by the central ILL facility.

Menu-client requests
If identification takes place by an end-user through access to the central menu-client, a LOAN command is transferred into the central ILL facility.

WWW-requests
If end-users are using a Web-browser for accessing the central Union Catalogue or the central Online Contents database they are not limited to searching only, but item ordering, both for articles and for monographs, is fully supported.
Library staff requesting

If identification is done by library staff (e.g. as a result of a question from a user at the loan desk), the request is entered directly into the central ILL facility. Requests can also be forwarded to the central ILL facility from external intermediaries.

External requests

In the Dutch PICA network, links exist with various organisations in the context of the ION, EDIL and DBV-OSI II projects. A similar mechanism is being used in a link between the central PICA systems in Leiden and Göttingen.

Routing

When requests are entered into the central ILL facility, either online or through store-and-forward mechanisms from OBN or external intermediaries, a candidate list is assembled using an automated and parametrised routing algorithm, e.g. taking into account the maximum amount that a library is willing to supply per day. This algorithm is currently under reconstruction to introduce more influence from the user and to allow for the provision of various service levels at different pricing. In principle the mechanism used in the central ILL facility is that of mail boxes, located on the central system, into which requests are moved. Mail boxes can either be accessed online by staff in the libraries or the messages in the mail boxes can be sent to an external e-mail address. A request is moved from mail box to mail box until a library indicates its willingness to supply, or no library is able to supply.

Request forwarding and supply

There are three ways that requests can be forwarded and evaluated.
**Manual handling of requests**

Library staff can log-on to their mail box and look at all requests that have come in for the library. To decide whether the item requested can be supplied or not, they might refer to the automated circulation control system if available, or rely on other, manual, methods. If the library can supply, they indicate positive status; otherwise, they reply negatively, after which the request is moved into the next potential supplier’s mail box.

**Forwarding to local circulation control system**

Recently, the option was introduced in the PICA environment to automatically transfer all requests in a mail box to a specific external e-mail address. This address is associated with a local circulation control system. The request will be matched automatically against the local circulation control database, and when it can be established that the item can or cannot be supplied, a reply is transferred automatically to the central system.

**International forwarding**

In a number of projects, the possibility has been introduced to forward requests to external suppliers. From the Leiden system, an operational link is available into the request facility of the British Library Document Supply Centre. Other examples can be found in the ION and EDIL projects, the experimental ILL link between Leiden and Göttingen, and the DBV-OSI II-project which is currently under development.

**Document delivery**

In the case of traditional mail delivery, either a volume or a photocopy is sent through PTT mail services. In the Netherlands, service agreements between libraries are such that returnable items are sent to the requesting library which is responsible for the return of the item, whereas photocopies are sent to the user directly.
A new service that has been introduced in the Netherlands is the RAPDOC service, which is aimed at the electronic transfer and delivery of journal articles. The following two components are involved in this service:

**Ariel Document Workstations**
A library that participates in the RAPDOC project can download the incoming requests into a PC package which is designed to support electronic delivery of documents. There are three elements present on these workstations that are used in supplying items: a package to download requests from the central ILL facility; a package to locally manipulate the requests in a work list; and a package to scan and transfer the document in electronic form. Furthermore, there is also an element available to receive and print electronic documents. The format of the documents is according to the GEDI agreements.

**Document Delivery Servers**
In larger libraries with more than one Document Workstation and/or local delivery services, a UNIX-based server can be used that takes care of the routing of electronic documents. At the supplying end, a DDS can match incoming requests with the circulation control system to determine from which department a given item can be supplied and, in case of multiple possibilities, can balance the load among a number of supplying stations. At the receiving end, the DDS can automatically notify the user through e-mail that his document has arrived and make the document available to the user, either through remote printing or by providing the end-user with the electronic address of the location where the received document is temporarily stored. The end-user can use this electronic address (URL) for accessing the local DDS with his Web-browser and thus load the document onto his own PC for private manipulation and/or printing.
Accounting

In the Netherlands, tariffs have been agreed between the libraries cooperating in the PICA ILL facility. The central system acts as a clearing house.

For end-users, the ILL deposit-account has been developed. Users pay in advance at the library’s loan desk. For the amount they pay, they get a number of ILL credits. When they request an item through the OBN or the menu-client, their account is debited. Again, the central system acts as the clearing house for accounting between the libraries.

Document Access

In February of this year PICA and a number of Dutch and German research libraries has launched the WebDOC project.

In the WebDOC project we aim to provide end-users with online interactive document access, using Web-browsers such as Netscape.

Technically there are three main elements in the project.

1. **The Document Servers**

   Document servers will be installed at each library and will contain electronic documents in a number of selected subject areas.

2. **The Central Catalogue WebCAT**

   WebCAT will contain title-information and abstracts together with the electronic reference to the related document and is an online catalogue providing functionality to the user via hyperlink.
The participants which maintain document servers also have the task to provide the catalogue entries for WebCAT.

3. **WebCASH**

The WebCASH facility makes it possible to let end-users pay for documents they retrieve, but also to verify if documents may be provided under the license arrangements of individual institutions.

In addition to the libraries currently participating, PICA is also negotiating with a number of publishers for participation in order to be able to cover journal article literature from commercial publishers.

At this moment the technical infrastructure is being set up and the libraries are organizing the process of collecting material to be mounted on their document servers.

In addition PICA and the Royal Library have developed a cataloguing format for electronic documents which the participating libraries are starting to use now.

By the end of this year we hope to be able to start a meaningful, although still experimental, service to end-users.

**Summary and conclusion**

Building on the basis of the existing ILL system an end-user oriented infrastructure for Document Ordering and Document Access is emerging.

End-users who have WWW-browsers on their desk can search the Union Catalogue, the Online Contents database and the WebCAT database or OPAC’s in the PICA OBN network for relevant items. After identifying an item the end-user can issue a request
for delivery if it is a paper document and access the document directly online if it is an electronic document available from a Document Server.

If it is a paper document and the user is served on the basis of the RAPDOC service, the document will be scanned by the supplying library and forwarded via SURFnet to the Document Delivery Server of the library to which the end-user belongs. Upon receipt the DDS notifies the end-user automatically through e-mail and informs the end-user about the URL under which his document is temporarily stored. After receiving the e-mail the end-user can point his Web-browser to the URL which has been provided and retrieve the document.

A central element in the service is the ILL deposit account and the mechanism for copyright licence management. The combination of central clearinghouse functionality and the prepaid ILL-accounts assures that the financial element can be covered. The copyright licence management function is a further step in addressing the copyright issue.

In the way described above the end-user has one interface through which he can obtain required documents, through a standard graphic user interface.

The end-user, who does not have WWW-capabilities on his workdesk, can use the VT100 menu interface through the Open Library Network for searching and item ordering, but through this interface electronic access or electronic delivery will not be possible.

In the future the service to the end-user can be further improved by opening the collections of libraries and library cooperatives in other countries. In this respect PICA's participation in the DBV-OSI II project, the EDIL-project and the ONE-project may prove to be of crucial importance.