EUROPAGATE

European SR-Z39.50 Gateway

IDENTIFICATION AND EXAMINATION OF EXISTING INFORMATION SERVICES AND USERS

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CEC Libraries Programme Project LIB-EUROPAGATE/2-2062

Work Package:	2	Responsible partner:	CL
Work Task:	1	Contributing partner:	CSIC
Deliverable:	D5		
Availability:	P	Date:	26 August 1994

Preface

The EUROPAGATE Study of the Project Environment is intended to provide information on non-technical aspects of the operation of the gateway service, which will be developed in the project by the project participants. However, as it may be of interest to others, it is made publicly available.

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1 Introduction

This part of the EUROPAGATE Background Study focuses on the identification and examination of existing information services and users. It is intended that, while the project will initially operate as a pilot service, it should become commercially viable. The study examines the information industry in which the service will operate, identifies that EUROPAGATE does not replicate a service that is already in operation and considers how the industry will influence the nature of the service to be offered.

Section 1 looks at the expansion of new services and distribution methods in the information industry. Library catalogue development is reviewed in Section 2. Section 3 looks at two examples of union catalogues, VISCOUNT and RAPDOC. Abstracting and indexing services are considered in Section 4 followed by Table of Contents services in Section 5. Section 6 reviews the development of bibliographic utilities. Section 7 examines some options for service provision through the gateway. In Appendix A, the LIB2 Study Reports for Ireland, Denmark and Spain are used to describe the level of implementation of new technology in these member states.

1.1 Historical Background

The information industry has expanded rapidly over the last two decades and as a market sector it is expected to continue to increase into the future. This expansion would not have taken place had the appropriate technological advances not occurred. Microcomputing developments and the progress of information technology, together with the emergence of new digital formats and telematics have enabled the growth of a genuine information market.

1.1.1 New Demands and New Services

IT developments have had a major impact on the services now being offered by libraries. Traditional catalogues have disappeared in favour of local computerised catalogues. In turn these are now being replaced by the provision of remote electronic access to bibliographic databases and to public and private information databases.

1.1.2 New Technologies

The increased reliance on remote access and the need to maximise the utilisation of resources has given rise to the demand for greater interconnectivity and correspondingly has provided the impetus for the adoption of standardisation and harmonization in software and hardware design and construction.

1.1.3 New Applications

The rapid advances in microelectronics have had a major influence on the development of computer hardware. This is typified by the trend towards down-sizing, the increase

in processing speed and power and the increase in computer storage capacity. The development of networking technology and in particular the fibre optic technology has revolutionised the way in which data can be transmitted both locally and internationally.

1.2 Methods of Distribution of Bibliographic Information

The development of new technologies has resulted in the emergence of new mechanisms for providing access to information.

1.2.1 Online Access

A principal method of providing access to computerised catalogues or databases is via online services. Typically the user has access via a terminal to a network. Online access has revolutionised the concept of the traditional library by allowing access not only to local databases but also to remote databases. The main problem with this method of distribution is the very high costs associated with network and telecommunications usage.

1.2.2 CD-ROM

CD-ROM provides the potential to store enormous amounts of data and is an economical and user friendly mechanism for data storage and access. However, it has the limitation of requiring constant updating in order to prevent data obsolescence.

Both online services and CD-ROMs require a specific hardware configuration and also require different access methodologies. The online system possesses an almost unlimited potential whereas CD-ROMs have a limited access environment since any remote access system to a CD-ROM would have to be secured by means of online access.

The system of data distribution based on CD-ROM is most frequently used for base producers of commercial data and their main users are libraries and documentation services.

1.3 Development of Information and Research Networks

Perhaps the most significant development in recent years is the development of communication networks, information networks and the emergence of OSI and TCP/IP communication standards or protocols all of which aim to secure interconnectability across systems and applications.

Academic and research networks have been developed locally (JANET, HEAnet, Nordunet, Surfnet, Iris) and across Europe (Europa Net and BITNET). However, the creation and growth of the Internet, the world's largest communication network, has been the most critical development in this area. Many organisations have joined this network in the last few years and thanks to the computerisation of libraries a multiplicity of new services have become available over the network to an international community of users. The services are based on the interaction of remote computers, file transfers and electronic mail systems. What started as a corporate

initiative between academic entities has broadened its scope and now includes a whole range of private enterprises (DIALOG, Silver Platter etc.). There are more than 2 million computers linked on the Internet today.

1.4 Communication Protocols and Retrieval Protocols

The development of these networks has been facilitated by the simultaneous development of the OSI and TCP/IP protocol suites which have established a series of rules governing the exchange of data between systems.

The search and retrieval protocols ANSI Z39.50 and ISO SR furnish a uniform method in a client/server structure that allows information to pass from a client to a server without the necessity to learn the individual search algorithms associated with each application and regardless of system platform.

1.5 Services

1.5.1 Public Information Services versus Commercial Services

The private sector has tended to cover the requirements generated by research and by companies through a deeper analysis of the information and the creation of more elaborate and costly products. The private information services are moving amidst an ever growing market which is generating sizeable profits while taking advantage of new technologies. The philosophy which has traditionally fostered the public information services has been the exemption from payment for services rendered or a minimal fee. The principal purpose pursued in the endeavour has been universal access to information mainly through the contribution of libraries.

2 Library Catalogues

The majority of automated library catalogues have integrated systems with the following functions available according to the needs of the library.

CATALOGUING	Data Entry and Amendment; Authority Control; Downloading.
CIRCULATION CONTROL	Issues; Returns; Renewal; Fines; Reservations; Short-term loans; Borrower files; Enquiries; Notices; Reports; Statistics.
ACQUISITIONS	Ordering; Receipting; Claiming; Fund Accounting; Enquiries; Reports and Statistics.
SERIALS CONTROL	Ordering; Receipting; Claiming; Fund Accounting; Enquiries; Reports and Statistics.
INTER-LIBRARY LOANS	Requesting; Transmission of requests; Receipt and loan; Returns; Renewals; Overdues; Recalls; Chasers; Reports and re-applications; Cancellations; Enquiries; Management Information.

Integrated systems represent a new step forward in library computerised systems where the different parts available build an ensemble acting interdependently while each function benefits from the other.

2.1 Online Public Access Catalogues

OPACs may include some of the following facilities:

- Online access for staff and public enquiry.
- Library defined indexes for staff and or public self teaching menu driven facility.
- Library defined display.
- Provision for keyboard and phrase searching.
- Direct display of record if only one match.

- Display of copy/status information through minimum number of screens.
- Index display if no match.
- Provision for browsing backwards and forwards in index and/or catalogues.
- Library defined help messages.
- Use of Boolean operators.
- Truncation of search terms.
- Limiting searches by search qualifiers.
- Different views of catalogues according to the type of users.
- Online access to catalogue

End user searching in most OPACs will not fully exploit the resources of the local collections as users may fail to find all possible relevant items in searches. Many users fail to grasp the concepts of Boolean retrieval and controlled vocabulary.

An effort is made to prevent the query language from becoming a barrier to the user. Even more, the utilisation of a single recovery language is proposed as an ideal solution, as close as possible to the natural language and irrespective of the system within which the user is working.

The interaction of users and automated library systems can be described in three phases.

a) Backroom: Housekeeping and cataloguing routines are automated with little impact on users.

b) OPAC automation is extended to the catalogues: the OPAC remains a limited interface between the library and the public. Other services remain counter based.

c) Distributed library services are networked- the functionality of the automated user library interface is enriched and distributed over the network.

Public Access

It is necessary to have a suitable interface for public searching, placing reservations if required on loaned items and items on order, and provision to display own borrower information.

2.2 Bibliographic Record Exchange

To facilitate library resource sharing initiatives between libraries, bibliographic standards and their application must be adhered to. This concerns primarily catalogue records and the ability to exchange them in a standard format. The development of exchange formats is central to the process of library automation. MARC records broadly conform to a range of standards but there are variations in application and interpretation in each country. Bibliographic record formats are mainly based on the ISO standard 2709. The MARC format is a widely used format but there are several individual derivatives and it is the general structure which is common to all formats calling themselves MARC. At present conversion between formats is still limited mostly from the US, UK, French and German records to other national formats. There is a general agreement on the need for a common bibliographic exchange format and that the format should be UNIMARC. UNIMARC was created with the existing formats in mind so conversion programs should not present a large obstacle.

2.3 Networks

Through the use of networks it is now possible for a number of libraries to share their collections. Users may be allowed access to the collective resources of the libraries. The user may have access to these networks at different levels (Local, National and International). This development justifies the assertion of “Libraries without Walls”. There is a necessity for the user to understand the protocols and search algorithms that apply to each library catalogue. This may be hampered by the linking difficulties between the networks resulting from the applications or the use of incompatible regulations or protocols. A relatively new option to consider is to have a client/server based system with the technical implementation based on ANSI Z39.50 with communication over TCP/IP or alternatively the ISO Search and Retrieve protocol over OSI (Open Systems Interconnection). OCLC and RLIN recognise that terminal based networks will be phased out to replaced by a client-server environment with a variety of connectivity routes.

2.3.1 Z39.50 Protocol

Z39.50 is a common set of procedures and formats connecting two processes; the originating system where requests are made and the target system where the database resides. The human interface is not included in the protocol. Communication is over TCP/IP (Transmission Control Protocol/Internet Protocol). There are four levels in the TCP/IP protocol suite: network access, Internet access, host to host and application processes. TCP is the transport protocol which ensures reliable host to host communication and IP is the Internet Protocol.

2.3.2 ISO Search and Retrieve (SR) Protocol

The ISO SR protocol is very similar to Z39.50, but with more limited functionality. It is normally implemented with communication over OSI. OSI is built on layers that define input and output. Each layer is defined in terms of the service which it provides, which means that a layer may be modified or replaced without disturbing the layer

above and below so long as the same service is provided. The OSI stack has 7 layers and each layer communicates only with the layers directly above or below it.

3 Union Catalogues

The progress in the use of electronic data processing systems in each single catalogue will result in a growing facility to have simultaneous access to the stocks of several libraries. Until the advent of client server technology, union catalogues or centralised databases answered this requirement. A union catalogue is a combined listing of the holdings of several libraries. It is a centralised database which allows direct access by users. A cooperative database is also necessarily a union catalogue, searchable as a unit, regardless of how its file structure distinguishes the records of each individual member library. Union catalogues inform the user on where one may retrieve information among a group of libraries with common subject areas. A union catalogue facilitates resource sharing among libraries. Shared cataloguing also offers advantages to libraries in that it can incorporate location information onto existing data in catalogues. This also catalogues allows for the adoption of initiatives in the field of acquisitions made on a cooperative basis. Offering for increased resources to the user. The major disadvantage of the union catalogue concept is that it requires regular updating, often in formats which require intermediate processing, from the participating databases. Union catalogues also require large central computer storage. Two examples of union catalogues are VISCOUNT and RAPDOC**.**

3.1 VISCOUNT

(Viewdata and Interlibrary System Communication Network)

3.1.1 Development

LASER developed the VISCOUNT service in order to support interlending of materials between libraries. The aims of Viscount are as follows:

- To produce a database of the resources of libraries in the United Kingdom.
- To develop a network which extends regional Union catalogue access by offering location identification; bibliographic identification and Inter-library loan messages.
- To achieve inter-library connection with other networks in the United Kingdom, Europe and North America by promoting OSI (Open Systems Interconnection).
- To improve the efficiency of library services and the availability of library materials and information.

The VISCOUNT database and network have developed from the long established UK interlending infrastructure which comprises ten Library Regions and the British Library Document Supply Centre (BLDSC). The original initiative for creation of the database and development of the network came from LASER which pioneered the automation of locations or holdings for direct interlending between libraries. In conjunction with the British National Bibliography (BNB), LASER converted, firstly, BNB from 1950–1968, and then the LASER retrospective post-1901 union catalogue entries into machine-readable form (MARC).

The LASER minicomputer system, developed between 1975–77, was one of the first online union catalogues in the world.

In the early 1980s, three other library regions in the UK sought access to the LASER system. This request for a shared database development coincided with the requirement to explore messaging for ILL, advanced telecommunications and information service via Viewdata and PRESTEL. This formed the original VISCOUNT development which included LASER, NWRLS, SWRLS and NLSLS. It was supported by BLR&D, BLDSC (which contributed its monograph file), BT PRESTEL and OCLC Europe.

By 1990, seven UK Library Regions and BLDSC were linked to the VISCOUNT system, for union catalogue maintenance purposes, ILL messaging, bibliographical checking and e-mail services.

All LASER's major users have online access for item/location identification, ILL messaging within and between the Regions, access to BLDSC's ART Tel 2, ARTTel-in-tray services and e-mail services. By 1993, 75 libraries had online access to VISCOUNT. In 1994, a number of library regions ceased access to VISCOUNT. Instead, those regions established independent union catalogues which offers the advantage of more closely matching the requirements of the regions.

Locations on the VISCOUNT database are displayed by region using the individual union catalogue library codes. Holdings of BLDSC are also given locations and can be added or deleted online. The VISCOUNT database allows the user to search under the following options:

- Book and Control Number;
- Author, personal and or/corporate;
- Dewey Decimal classification;
- Date of publication and wildcards.

3.1.2 Technology and Costs

VISCOUNT can be accessed by a range of IBM compatible PCs but it is recommended that libraries obtain equipment recommended for VISCOUNT. The PC is configured to include a communications package for accessing VISCOUNT via a range of British Telecom services. Subscriptions to VISCOUNT are charged annually or pro-rata for libraries joining part way through the year.

3.1.3 Future Development: Project ION

Project ION is an interlending open systems inter-connection (OSI) network pilot/demonstration project between LASER, Pica (in the Netherlands) and PEB (the interlibrary loan system of the French Ministry of Education).

The overall objectives are:

- to achieve interconnection between three computerised library networks in the UK, the Netherlands and France.
- to improve the efficiency of international interlending services
- to demonstrate the capabilities of OSI communication

This is the first pilot/demonstration project in the world to implement the internationally agreed ISO protocols for interlibrary messaging (ILL protocols) and for searching databases of protocol. This has been achieved by the development of three front-end processor systems which are in the process of being integrated with AEG MODCOMP computer at LASER, the TANDEM/DEC configuration at Pica and the IBM Computer at the French network centre, SUNIST.

The project, which began in 1990, is in three phases:

- Specification development
- Procurement and development
- User Evaluation and future market and product exploitation

Phase 2 is nearing completion and it is expected that 50 test-site libraries will use and evaluate the ION service for a nine month period beginning in June 1993.

The ION service includes:

- Interlibrary loans
- Loan requesting
- Answer-material requested is unavailable
- Shipped-material requested is available and shipment is initiated
- Messaging service-free form text
- Status and error reporting
- Searching and retrieval
- Initialise a search of an international database
- Searching an international database
- Present-retrieving information from an international database
- Accommodating differences in national MARC formats
- Use of UNIMARC between international systems
- Providing transparent user access to different search designs in the systems of the ION participants
- Positive identification of material for the international ILL service

3.2 RAPDOC Project

The Dutch RAPDOC Project is a further example of a union catalogue. This was set up following several analyses of Pica's automated ILL system for periodicals which dealt with 350,000 requests for journal articles per year. It was also evident that in a

number of cases the end-user did not receive the requested article in time. The main aims of the RAPDOC project are improved access to periodical articles incorporated with an automated service for fast delivery of requested articles. 19 major libraries are executing the project and they aim at electronic delivery of requested articles from 7,000 scientific periodicals within 24 hours. After analysis of the journals the Core Collection of 7,000 periodicals were chosen. Each participating library is responsible for delivery of a set number of requests from a certain number of titles. Pica reached an agreement with Swets by which the supply of machine-readable article records is regulated and this will be stored on Pica's central system. The Table of Contents information will be mounted on the central system and data subsets will be distributed by downloading to the local library systems of the RAPDOC libraries. The subsets will be related to periodicals and holdings which are locally available. Libraries can add the contents information to their OPACs. End users will be given menu-driven search facilities for both local and central databases. Articles can be requested locally or through the central system for non locally available material that forms part of the Core Collection.

3.2.1 Electronic Transfer

Identification and ordering of documents will take place through the centralised on-line contents database and through software functions running on the central Pica computer. The central facility will use its routing procedures to deliver the request to the appropriate supplying library. RAPDOC aims at a high standard of quality for the reproduction of transmitted documents and as a result of this fax technology is not used. RAPDOC only aims for the transmission of documents in electronic format.

4 Abstracting And Indexing Services

Abstracting and Indexing services are available both online and in CD-ROM format. LISA (Library and Information Science Abstracts) is an abstracting service which is available to libraries and contains articles from library related journals. It is available online, in CD-ROM format or hardcopy and is updated regularly. Two examples of organisations which provide abstracting and indexing services are DIALOG and OCLC.

4.1 DIALOG

DIALOG Information Service is a huge database host offering access to over 400 public databases covering thousands of business and technical publications. In order to combat the problems of selecting a database in over 400 databases DIALINDEX allows the user to perform a search in a massive master index file and gives information on which database contains the answer to the search. The DIALOG Knowledge Index gives the user access to over 100 popular DIALOG databases including MEDLINE and it covers the following subject areas:

- Agriculture and Nutrition
- Books and Monographs
- Chemistry
- Company Information
- Computer Technology
- Energy and Environment
- Industry Analysis
- Law and Government
- Medicine and Biosciences
- News
- Patents and Trademark
- Popular Information
- Reference
- Science and Technology
- Social sciences and humanities

DIALOG offers Indexing and Abstracting services on their related databases. An example of this are the related databases of Law and Government. This contains

- Congressional Record Abstracts
- Criminal Justice Periodical Index
- Federal Register Abstracts
- Legal Resource Index

The related databases of Science—Energy and Environment contain the following abstracting and indexing services.

- API Energy Business News Index

- Aquatic Science and Fisheries Abstracts
- Meteorological and Geoastrophysical Abstracts
- Oceanic Abstracts
- Pollution Abstracts

Other subjects which contain both abstracts and indexes are

- Multidisciplinary—General Information
- Multidisciplinary—Reference
- Patents, Trademarks and Copyright
- News
- Science—Agriculture and Nutrition
- Science—Chemistry
- Science—Computer Technology
- Science—Energy and Environment
- Science—Pharmaceuticals
- Science—Science and Technology

Subject access to the DIALOG databases is offered through two file search options DIALINDEX which was already mentioned and DIALOG OneSearch.

4.1.1 One Search

One Search was introduced in 1987 and is a search facility which allows users to search more than one database without having to re-enter terms or execute a search save in each additional file. One Search enables many databases to be searched with a single command, a comparison of search results across files, modification and combination of search terms and a display of results. Full offline prints are available with OneSearch.

4.1.2 DIALOG ONDISC Services

The DIALOG line of CD-ROM information products has gained widespread acceptance since its introduction in 1987. An ONDISC file contains the same information as is available online. There are indexing services available in the CD-ROM format like, for example, the Philosopher's Index.

4.1.3 DIALOG Pricing

Users are required to sign a contract to access DIALOG. There are no sign-up fees but DIALOG charges a $35 annual service fee (an exception is Knowledge Index where a $35 fee is charged to sign on). The majority of DIALOG's cost is based on connect time. This varies between databases from $15 to $300 per hour. Average charges are about $60-$80 per hour. Discounts are offered to those who contract to use a certain level of hours per month. The system is available 24 hours per day except on Sunday between 3.00pm and 3.00am US Eastern Time.

4.2 OCLC

The FirstSearch Catalog is an online reference service with an end-user interface designed specifically for library patrons. FirstSearch is available to any institution.

Libraries ordering pre search can use the Z39.50-1992 capability to access FirstSearch. Since the Z39.50 standard does not currently support document ordering and ILL, OCLC has prepared supplemental software.

4.2.1 Access to FirstSearch Catalog

The principal methods of access to the FirstSearch Catalog are

- Internet
- National Academic Networks
- Value Added Networks

FirstSearch offers access to a variety of databases using a common interface. The FirstSearch Interface is an easy search process that requires no special training or online searching experience.

4.2.2 Local system interface

These are familiar search strategies for searching remote databases. If a system is Z39.50 compatible it can communicate with FirstSearch.

The EPIC service is an online reference system that provides subject access and keyboard and Boolean searching to a variety of databases.

The following Indexing and Abstracting services are available in the FirstSearch and EPIC databases.

- Applied Science and Technology Index
- Art Index
- Biography Index
- Biological & Agricultural Index
- Business Periodicals Index
- Concise Engineering Index
- Consumers Index
- Cumulative Book Index
- Education Index
- General Science Index
- Humanities Index
- Newspaper Abstracts
- Periodical Abstracts
- Readers' Guide Abstracts
- Social Sciences Index
- Wilson Business Abstracts

4.2.3 OCLC FirstSearch Prices

Searches are sold in blocks of 500. The prices vary from one block of 500 searches at $575 up to 80 blocks of 40,000 searches at over $30,000. Searches must be used within 2 years after they are issued.

5 Table Of Contents Services

The electronic scanning and editing of the tables of contents of scholarly journals has been developed in response to an increasing demand for faster access to research information. Once an organisation has access to a large number of journal titles a table of contents service can be set up which weekly or monthly mounts all the articles contained in these journals onto one system. This system can be delivered to the end-user in many different forms. Table of Contents services available in Europe include BLDSC's Inside Information, Blackwell's UnCover, SwetScan and OCLC's FirstSearch. UnCover and SwetScan provide good examples of two such table of contents services offering very much the full range of choices for users.

5.1 UnCover

UnCover is provided in Europe through a partnership with CARL Systems Inc. of Denver, USA and B. H. Blackwell Ltd of Oxford, UK. Currently articles are entered regularly from over 15,000 titles making it the largest system available.

5.1.1 Pricing

Basic consultation of the database is free with charges incurred only for tailored services or document delivery (UnCover can provide a fax of a document within 24 hours or less of ordering). The various pricing packages available include:

(1) Free access to the file. Documents are at $8.50 plus copyright fee (which varies between publishers) and fax surcharge (depending on where the document is delivered).

(2) Offers a Password for $900. Documents charged at $6.50 plus copyright fee (c.f.) and fax surcharge (f.s.).

(3) Standard gateway allowing all networked users within an organisation access to the file without their being issued with individual passwords. The gateway costs $5,000 and documents are $6.50 plus c.f. and f.s. There is also a $300 free document credit.

(4) Customised Gateway offers all the features of the standard gateway and also customised screens, indication of local holdings and two dedicated access channels to UnCover. Documents are $6.50 plus copyright and fax and again $300 free document credit is available.

5.1.2 IRIS/UnCover

IRIS/UnCover provides an example of the way in which a gateway can be tailored to meet the needs of a group of users. IRIS/UnCover is the result of a partnership agreement between the CARL Systems Inc., B.H. Blackwell Ltd and IRIS Document

Delivery Services Ltd. The service provided is designed to meet the needs of two distinct categories of users: library users have access to UnCover at the lower rate of $6.50 per document by fax. However, local holdings information is also included on the database which allow library users to order a document from a local library at a lower rate. Business users and individuals have access to the standard service.

As part of this agreement, IRIS libraries became suppliers of table of contents information to UnCover which enhances their coverage of European titles.

5.2 SwetScan

Swets Subscription Service began electronically scanning contents pages under an agreement reached with PICA. This agreement allows for the continuous registration of some 12,000 journal titles (to be increased to 14,000 by summer 1994) appearing in the reviews more commonly used under the interlibrary loan system of the 12,000 libraries that are integrated in the network. The process is carried out in the company itself and once mistakes are controlled and rectified, the entries are loaded into the PICA control system and may be consulted on-line. The article information represented is for the most part complete: journal title, ISSN, year-volume-issue, article name, author(s) and page numbers.

SwetScan can be ordered in many different forms:

- Weekly hard-copy printout
- Weekly on diskette (3.5in or 5.25in)
- Weekly on tape
- Continuously via DataSwets, the worldwide online information and communication system which currently offers alphabetically arranged lists of scanned titles within subject fields, author and article searching using Boolean operators and hopes to offer abstracts of articles and an alerting service on the latest issues scanned.

Within each of these forms one can simply order the contents pages of journals already subscribed to or one may subscribe to the full title, i.e. all titles included on SwetScan.

This above choice determines the issue of payment method. There is an annual fee per title upon which there is a 50% discount allowed for titles subscribed to through SwetScan. There is a sliding scale of discounts offered ranging from 15% to 70% and these are contingent upon the number of titles subscribed to through SwetScan.

The final point to be looked at in the context of table of contents services is the issue of a complementary article delivery service, SwetDoc. SwetScan are in consultation with the British Library Document Supply Centre as well as with major publishers in order to organise as comprehensive and effective a service as possible.

6 Bibliographic Utilities

The central function of the Bibliographic Utilities is to make available vast reference databases for use in libraries and other resource organisations. Records may be grabbed from a specific library catalogue or from collective, computerised catalogues. This may be done through an online consultation or using a CD-ROM medium. These records are presented for sale in many different forms. The cheapest and most efficient of which is the grabbing of the complete record from the extant computerised catalogue. The utilisation of the authority inputs of a catalogue for the creation of another one is also possible. In this case, the full record is not used but only the access standardised points for the author, subject, series etc.

This service is provided by two main types of bodies:

(i) Large libraries such as the Library of Congress and the British Library. In the case of the Library of Congress the editions in CD-ROM are very extensive:

- CDMARC Bibliographic
- CDMARC Names
- CDMARC Serials
- CDMARC Subjects

Through the British Library Document Supply Centre, the British Library offers as a CD-ROM the following bases:

- Boston Spa Books
- Boston Spa Conference
- Boston Spa Serials

(ii) The services offered by the four North American Utilities (OCLC, RLIN, UTLAS and WLN) are quite similar but they differ in their histories, administrative structures and commercial interests. Thus for example OCLC has emphasised database expansion over record quality while RLIN hold to the reverse. In order to look at some of these services let us take OCLC as an example of one such Bibliographic Utility.

The main product offered by OCLC is the FirstSearch Catalog. This end-user online information service offers access to OLUC (Online Union Catalog), which is a very comprehensive catalogue (over 27 million records). Also available on FirstSearch are ArticleFirst and ContentsFirst. Through these two table of contents databases one million worldwide articles are available to the buyer. Access to the FirstSearch Catalog can either be through direct dial or over the Internet. FirstSearch is Z39.50 compatible and so local systems must be Z39.50 based in order to attain access (in this case only available over the Internet). Payment for access to First Search can be by annual subscription or through a per-search pricing structure. In the case of the latter searches are sold in blocks of 500. In 1993 one such block cost the buyer $575 with bulk buying reducing the price considerably.

Other services offered by OCLC include:

(a) The Epic service. This service is designed for the professional searcher and thus offers complete subject and keyword access to OLUC, an expanding collection of databases and sophisticated system capabilities such as offline prints, current awareness profiles and extensive record sorting.

(b) Site Search. This is a software system allowing libraries search their own local database and also the remote FirstSearch database using one common interface.

(c) OCLC Dispatch Service allowing for document ordering direct from FirstSearch databases through a variety of document suppliers.

(d) Interlibrary loan services (PRISM). The benefits of using one online database to verify bibliographic information and identify holding libraries (of which there are approximately 15,000) has been coupled with new PRISM capabilities such as title browse, combined search keys and full screen editing. One system allows you send a request to five different lenders and to the request's status, notifying you about its shipment.

(e) Conversion services. OCLC offer either customised or batch conversion to MARC format. In the case of customised conversion the retrocon service allows for more individualised specification of records — OCLC staff search for and customise matching records. In the case of batch conversion one's own staff enter search keys on diskettes, which are mailed to OCLC for machine matching against the Online Union Catalog. Other conversion services offer variations on these two themes, e.g. Online Retrospective Conversion — one's own staff use the Online Union Catalog to convert one's records at reduced rates, giving direct control.

7 Gateway Services And Users

This study has concentrated on the identification and examination of existing services and users in the library and information sector. All of these services are based on earlier technological applications using diverse searching and user interfaces. Some distributed database applications using SR/Z39.50 are becoming available but, with some exceptions, these are still experimental.

7.1 Gateway Objectives

The objectives of EUROPAGATE are:

- to allow systems and networks to interoperate
- to remove barriers to global access to information
- to provide the user with resource direction and flexibility of choice.

The EUROPAGATE gateway will offer to both Z39.50 Version 2 and ISO-SR clients transparent access to all servers irrespective of whether the communication stack is TCP/IP or OSI. The gateway will also provide the administrator with the appropriate tools to manage the gateway service.

7.2 How the Gateway Will Operate

It is intended that the gateway will provide quick and easy access to a wide range of bibliographical databases irrespective of the type of server or transport mechanism used by the databases. The user will either log on to the gateway, which will act as the service provider for the database, or the user will log on to the database in which case the gateway is invisible to the user. In both instances, the gateway service is a service to database providers. The gateway client will access the requested remote server and will work transparently to the user.

7.3 Market Environment

EUROPAGATE is primarily demand stimulation. The information market as discussed in earlier chapters is slow to follow the trend towards distributed systems and client-server technologies. New services may not be categorised in the same way. Client-server technology will allow links between services which are independent of each other at present. The user ideally would wish to discover a database source, locate an item, establish availability, order it and have it delivered electronically. Some of the links in the ideal scenario would be SR/Z39.50 based, others could be enhanced gateway functions.

Servers in operation at present are mostly US based and are mainly the databases of individual academic libraries. These databases are freely available over the Internet but

do not provide a service to remote users. There are many possible ways in which this market will develop. What is certain is that the pace of development will be rapid.

7.4 Gateway Market

Some general observations can be made in relation to the potential take-up of the gateway service. Existing service providers are migrating to client-server technology, e.g. OCLC, and this trend will continue. New and different services are becoming available due to the developments of SR/Z39.50 and electronic document delivery and the gateway market will primarily be these service providers. The end user of the services may continue to be libraries and information units but individual users will also be targeted by service providers. Individual users are now familiar with the potential of access to remote databases using the Internet Gopher or World Wide Web. There is little organisation or directory services of library databases but equally few barriers in terms of access charges.

A LIB2 Studies

A.1 Background

In 1986 the European Commission carried out a parallel study in each of the 12 member states to determine the state of the art of the application of new information technologies in libraries. These studies determined:

- the extent to which catalogues existed in machine-readable form
- the role of library networks
- the level of automation for the other library housekeeping functions of acquisitions, circulation control and local cataloguing
- the use of computer based user-related services
- the nature and level of inter-library transactions and activities

Wide discrepancies were revealed between the 12 member states.

In 1990 the European Commission Directorate General XIII/B felt that it was necessary to review the current position of automation in the libraries of the member states and another series of studies were undertaken. The update study was planned to be conducted simultaneously in all 12 member states over a six month period from October 1990 to March/April 1993. This time scale was extended and completed finally at the end of October, 1993. The update study of 1990/91 did not repeat elements of the original study which had remained unchanged. Four key areas had to be studied:

- machine-readable record resources
- network access to machine readable resources
- integrated library housekeeping systems
- IT based user services (CD-ROM was specifically excluded since it had been the subject of a Europe wide EC-funded survey in 1990)

For the purpose of the EUROPAGATE Project, the LIB2 studies of Ireland, Denmark and Spain were researched in greater detail.

A.2 Contractors

With the exception of Greece, the contracts for the update study were allocated through the same organisation as were used for the LIB2 Study in 1986.

In Denmark the work was carried out by the National Library Authority, in Ireland it was carried out by University College Dublin and in Spain it was carried out by the professional association, FESABID.

A.3 Data Collected About Libraries

Most contractors preferred to collect data on libraries from printed sources and from selected interviews. The methods chosen for Ireland, Denmark and Spain were as follows.

A.3.1 Ireland

Reports from Ireland cover almost all libraries in the country. 100 institutions were surveyed with a response rate of 85%.

A.3.2 Denmark

Reports from Denmark include 100% coverage for all types of libraries within the public sector (including school libraries). Data collection was based on available information in the contractor's organisation; 250 public libraries report annually on their computer applications; 177 academic libraries received questionnaires. This data was supplemented by selected interviews.

A.3.3 Spain

Reports from Spain were based on 182 questionnaires with a response rate of 66%. Data relating to record resources, networking and commercial products was compiled through interviews and other available information.

A.4 Ireland

Michael Casey and John Steel, "Applications of new information technologies in libraries: an overview of the Republic of Ireland" (Dublin 1991).

A.4.1 Library Population

National Library	1
Public Library Authorities	31
Education Libraries	32
Special Libraries	64

<u>Computerised Catalogues</u>	
Education libraries	17
Public library authorities and the Library Council	6
Special Libraries	19

There is a trend in education libraries towards online catalogues for both staff and users. LANs are also emerging.

A.4.3 Machine Readable Record Resources

In Ireland the number of machine-readable records increased by 12.5% from 1986–1990.

1986: 3,840,000 records
1990: 4,815,000 records

The National Library of Ireland, Trinity College Dublin and University College Dublin were involved in a co-operative project which had as its objective to computerise the 1990 issue of the Irish Publishing Record.

UNIMARC will be adopted by the National Library of Ireland as the preferred format for national and international exchange.

The technical universities in Ireland have almost all titles in machine-readable form while in the public library section the percentage of records available varies from 5% to 78%.

The majority of public library catalogues are being made available online only.

A.4.4 Network Access to Machine Readable Records

Networks available to libraries in the Republic of Ireland include EIRPAC and HEAnet. Some of the important academic libraries have connected their OPACs to JANET as well as to EARN. However, little traffic is generated on these networks by Irish libraries for the purpose of accessing the catalogues of other libraries in Ireland or overseas.

Most universities have campus LANs. Access via WANs is currently available to three university library catalogues and is technically possible to other university libraries.

A branch communications network has been developed in Dublin Public Libraries and similar developments are underway in other public libraries which operate automated library systems.

Some of the large special libraries operate closed, intraorganisational, national and international wide area networks with their catalogues are available to staff.

A.4.5 Computer-Based User-Related Services

Two changes relating to computer-based user-related service are evident from the present study.

- There was an increase in the use of online databases by special libraries in 1990 (total 1,300 hours over 12 months) compared to 1986 (total 830 hours over 12 months).

- Videotex connect time by Irish libraries is significantly reduced since the closure of the Irish videotex service, PATRIC, which served as an Irish libraries database.

A.5 Denmark

"The State of the Art of the application of new information technologies in libraries and their impact on library functions in Denmark: A reassessment study" (Copenhagen, 1991)

A.5.1 Library Population

National Library	1
Large Academic libraries	19
Small Academic and Education libraries	159
Public Libraries	250*
School Libraries	275*

Computerised Catalogues

National Library	1
Large Academic Libraries	19
Small Academic and Education Libraries	64
Public Libraries	65
School Libraries	250*

* Indicates that the numbers might be higher than shown.

A.5.2 Machine Readable Record Resources

The production of machine-readable records of the national bibliography undertaken by the Danish Library bureau includes:

- Monographs (1970-)
- Articles (1981-)
- Recorded Music (1984)
- Audio-Visual Materials (1980-)

The national bibliographic records may be accessed online in the databases BASIS, ALBA/SAMKAT and Artikelbasen (articles only).

The Royal Library is responsible for the Danish National Bibliography for periodicals, maps and printed music. The Royal Library OPAC contains monographs published after 1980 (i.e. 530,000 records out of 3.3 million titles) and the State and University Library in Aarhus has only 25% of its holdings in machine-readable form.

Most academic libraries in Denmark started automation in 1980. Records before this are with few exceptions not converted.

The database ALBA/SAMKAT is the main record resource in Denmark. This is maintained by the Computer Department of the National Library Authority. This covers:

- National bibliographic records

- National bibliographic records from BL and LC (1981-) reformatted to DanMARC
- Records from academic libraries, union catalogues for foreign literature in academic libraries
- ISDS file
- Holdings data for Nordic libraries

The trend during the last 4–5 years has been towards separate local databases existing alongside the central system databases. This trend may partly be due to the wish for extensive use of subject retrieval, which is not easily obtained in the central system at least in the academic libraries, because of the almost total lack of co-operation in the field of classification and subject terms in these libraries, and partly due to special wishes to accommodate local users. Another reason is that the development of circulation systems seems to be more easily handled in local systems than in a central system.

A.5.3 Network Access to Machine Readable Record Resources

In Denmark the OPACs of the major academic libraries can be accessed via the Danish university network DENet. This is operated by UNI-C, who also operate the Danish node in the networks EARN, BITNET and NORDUNET.

Access to the central database and the local library systems through the common network has greatly improved the communication between the academic libraries as well as between the libraries and the central system. It is a further advantage, that the network is a standardised network which at the same time ties access to other database of relevance to the libraries, among theses prominent Norwegian and Swedish database. The TCP/IP standard of the DENet is supposed eventually to be further developed into an OSI standard. Further standardisation work is needed in this area. With X.21 the public libraries have a very cheap way of accessing the central databases, BASIS and Artikelbasen, but they cannot without an extra access ALBA. A change will occur when a network is established in the DANBIB cooperation with the same technology as in DENet. The Danish telecommunications companies (in 1991 merged into one company, Teledanmark), expect this year to introduce ISDN. The rapid development of the networks and the introduction of ISDN is expected to result in cheaper communications in the near future.

A.5.4 Computer-Based User-Related Services

A.5.4.1 New Library Materials

In Denmark a special branch of Copenhagen City libraries was opened dedicated to offering computer software for public lending.

A.5.4.2 Community Information

In public libraries in Denmark, Community information and business information are well developed services.

A.6 Spain

"The state of the art of the application of new information technologies in libraries and their impact on library functions in Spain: A reassessment"

A.6.1 Library Population

National Library	1
Public Library Authorities	1,735
University Libraries	33
Special Libraries	113

Computerised Catalogues

National Library	1*
Public Library Authorities	33
University libraries	13
Special libraries	68

* The figure from Spain is only for OPACs, not for all housekeeping functions. ILIADA, a system specially designed for the National Library, was installed in 1991.

In 1986 Spain had no national bibliographic records in machine-readable form while in 1991 approximately 100,000 records had been created for the Bibliografia Espanola. The national bibliography will become available on CD-ROM.

University Libraries

662,580 monographs and 51,181 periodicals are machine-readable.

Special Libraries

284,563 monographs and 5,070 periodicals are machine readable.

Public Libraries

538,677 records had been created for monographs and 2,856 periodicals.

An estimated 1,741,927 machine-readable records exist in Spanish Libraries.

A.6.2 Network Access to Machine Readable Resources

The most apparent changes have occurred in the University environment. In the 1986 study the only network mentioned was that of CSIC (Higher Council for Scientific Research) Libraries.

The DOBIS /LIBIS network set up by seven Spanish universities and the Red de Bibliotecas Universitarias (REBUIN - University Libraries Network) were in an advanced state in 1991. Co-operation between these two networks is established. The

IRIS programme in Spain has initiated the Caixa de Catalunya library network and other networks like the SIBI.

Other network projects like the Xarxa de Bibliotheques Populars de la Diputacia de Barcelona (Deputation of Barcelona Public Library Network) and the Red de Bibliotecas Publicas de Estada (State Public Library Network) were mentioned in the Spanish study but were not functioning at the time of the study.

A.6.3 Computer-Based User-Related Services

In 1991, libraries in Spain as in other parts of Southern Europe had only introduced basic IT-based functions, except for information retrieval on CD-ROM and online searching, when possible. Therefore basic communication tools like fax were still lacking in 1991.

A.7 Conclusion

Although the data provided in the 12 national reports are too inconsistent and the methodologies used vary from country to country, the 12 national studies provide an enormous amount of useful information on the prevailing position of automation in the libraries of the EC member states in 1991. The LIB-2 update reports were very useful in providing numerical data for integrated library housekeeping systems.

It becomes apparent from the data provided that it is necessary to consider the northern and the southern European countries separately as on one side there are saturated markets ready for second generation systems while on the other side there are countries without integrated systems in 1991.

Since 1986 a significant take up of automation has taken place in Denmark and Ireland while in Spain the growth rate has been impressive with automation processing quickly. In 1987 only 42 libraries in Spain had started automation while in 1990 around 115 are mentioned.

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