ISSN 1018-5593

Commission of the European Communities

information management

STATE OF THE ART OF THE APPLICATION OF NEW INFORMATION TECHNOLOGIES IN LIBRARIES AND THEIR IMPACT ON LIBRARY FUNCTIONS: A REASSESSMENT

Report
EUR 14085 EN

Blow-up from microfiche original

COMMISSION OF THE EUROPEAN COMMUNITIES

information management

Libraries programme

State of the art of the application of new information technologies in libraries and their impact on library functions: a reassessment

DENMARK

The Danish National Library Authority
Nyhavn 31e
DK-1051 COPENHAGEN

LIB/2 update Report

Directorate-General
Telecommunications, Information Industries and Innovation

Directorate
Information Industry and Market

1992 **EUR 14085**

Published by the
COMMISSION OF THE EUROPEAN COMMUNITIES

Directorate-General
Telecommunications, Information Industries and Innovation

L-2920 LUXEMBOURG

LEGAL NOTICE

Catalogue number: CD-NA-14085-EN-C

PREFACE

This study entitled "State of the art of the application of new information technologies in libraries and their impact on library functions in Denmark: A reassessment study", LIB2-UPDATE/4 for short, has been prepared according to the study contract between The Commission of the European Communities DG XIII B and the Danish National Library Authority.

It follows on from the previous study of 1986 entitled "State of the art of the application of new information technologies in libraries and their impact on library functions", (the LIB-2 Study), published as EUR 110361 together with analogous studies from the other EEC countries.

Following on from the previous study the present one deals mainly with developments taking place after 1986. It has not always been possible to draw a sharp dividing line, but in principle the report is based on the situation as it presented itself at the turn of the year 1990/91, when nothing else is explicitly said in the text.

It should be noted that this report only covers libraries in Denmark. The Kingdom of Denmark also consists of Greenland and the Faroe Islands. These two territories are self-governing, they are not members of the European Community and they have their own library services. The library act covers only European Denmark. There are, of course, national libraries and public library services in Greenland and the Faroe Islands. There is no real impact of library automation in these libraries.

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SUMMARY

Introduction

Since the LIB2 report there has been a rapid development in the field of IT in Danish libraries. Online catalogues are today the preferred catalogue form, an important information source for the library users as well as for the library staff. In those libraries which have implemented an automated system for one or more library functions, the online library catalogue is the central part of the system. Nearly all libraries have some IT experience, and will at the very least be using the databases of the central systems for retrieval of literature for ILL. Library household systems are found in more and more libraries, and networking is building up.

In Denmark as in other European countries library budgets have been reduced or at best remained unchanged during these last years, and the political trend towards reduction of the public sector has hit the libraries hard. The decrease in staff in spite of increasing use of the libraries as a whole has rendered necessary both rationalization and efficiency improvement, and thus underlined the necessity for IT applications.

Machine readable record resources

Machine readable records are mainly to be found in the two important Danish database systems ALBA/SAMKAT and BASIS. A third database system, Artikelbasen (The article base), contains source data articles in periodic publications.

The union catalogue for the academic libraries (ALBA/SAMKAT) is online accessible, representing holdings of the majority of these libraries. This system has grown and undergone considerable changes since the LIB 2 report was first prepared.

Apart from the main resource of library records, this system hosts some other, smaller databases, which are not entirely bibliographic.

In the ALBA/SAMKAT system the Danish national bibliography as well as records from BL and LC are available as a cataloguing resource.

During the past few years a group of libraries has been developing local library systems with records of their own holdings and in some cases holdings of "satellite" library catalogues as well.

Bibliotekscentralen (BC, The Library Bureau) produces the records covering monographs and various kinds of non-book material in the National Bibliography. These records together

with the union catalogue for public and school libraries are available to the public in BASIS, which is hosted by Kommunedata (KMD). There is, moreover, a union catalogue of periodicals in the public libraries, named PIF, in BASIS. BC produces the records and the online database of periodicals.

Retroconversion

Financed by a state grant BC has converted the National Bibliography for books completely for the period 1976 to 1970 and a comprehensive selection of titles before 1970, and these records are to be found online in BASIS.

Very few academic libraries have retroconverted significant amounts of their catalogue records. A national plan for retroconversion is expected this year.

Network access to machine readable record resources

A new feature of the ALBA/SAMKAT system is the connection to the DENet (i.e. Danish Ether Net) of the Danish universities, which is a nationwide network based on ethernet and the TCP/IP protocol. ALBA itself and the largest local library catalogues have been connected to the DENet, which gives access to other TCP/IP based networks as well. DENet is maintained by Uni*C (the Danish Computer Centre for Research and Education). The network access has been established during the past year and is now working with reasonable stability.

All public libraries use BASIS and Artikelbasen through the public X21 network.

Integrated library housekeeping systems

Local library systems with housekeeping facilities have been built up for a growing number of libraries. While there were 3 pioneering libraries at the beginning of the 80'ies (The National Technological Library, The State and University Library and Aalborg University Library), the number of library systems has now grown to about 10 academic libraries and 67 systems in public libraries. The local systems consist at least of cataloguing systems and OPACs with advanced retrieval facilities.

13 main vendors on the Danish market have supplied the library systems and the system modules which are implemented. Some of the Danish libraries are close to having fully integrated systems, able to handle all library household areas. In-house development of system modules is seen as well. Two systems of non-Danish origin are found. Management information systems or budget control systems are not seen.

About eight academic libraries have started entering orders

for acquisitions online. As far as one knows, no libraries send orders online to foreign or domestic suppliers, except occasionally on an experimental basis.

Several academic libraries have been implementing serials control systems during the past years, and most recently automated circulation to readers of periodicals in research and university institutes have been established in some of the libraries (about 5).

ALBA/SAMKAT has built up a central housekeeping facility: Books from 13 of the larger libraries participating in ALBA/SAMKAT may be requested by ALBA/SAMKAT users for loan via the mail box system. The mail box has been in operation since mid-1990.

The first few changes of system have now taken place.

An estimate of the investment in library automation in the Danish libraries in the period 1986-1990 gives figures of a little more than DKK 100 million for the academic libraries and DKK 150 million for the public libraries, while the figure for the school libraries may be estimated at about DKK 5 million.

IT-based user services

As mentioned above, many higher education libraries and special libraries offer OPACs to their users, as do about 10% of the public libraries. Access to the library catalogues - the OPACs -is offered directly from university institutes or other locations by the network, or by dial-up. In those academic libraries which have introduced automated circulation systems it is possible to make reservations for loans of books or periodicals by the same ways of access.

Information retrieval in external databases is offered - usually at a charge - by most of the university and special libraries as well as by many university institute libraries, as described in the first report. Libraries participating in indexing to Nordic or other international databases (Energy, Pepsy, AGRIS etc) are continuing this practice. 10% of the public libraries (i.e. 25) are also users of external databases.

The number of libraries offering user access to CD-ROMs is growing. This service is now offered in several higher education libraries (most of the university libraries and several special libraries) as well as in 25 public libraries. In a few academic libraries the CD-ROMs are offered for multi-user access through the network of the library.

One public library (Herning) is developing highly user friendly terminals for OPAC use, particularly one with a double screen, enabling the user to watch the operation when

the information retrieval is being done by the librarian.

Several public libraries have with support from the public libraries' special state grant fund (Dispositionssummen) completed projects concerning use of new media and IT-based facilities (see ref. 34-37, 39-40, 42-45).

Future development

The most interesting development in the near future is to be found in the central systems. Negotiations concerning close cooperation between the two central database systems - even as far as making it one system - have been going on during the autumn of 1990. Forskningsbibliotekernes edb-kontor (FEK, The Computer Department of the National Library Authority) and Bibliotekscentralen (BC, The Library Bureau) have recently agreed to work together in setting up a joint group for development of a data model, tentatively called DANBIB, for the next generation of the input system, and a central database system as well.

This system may be expected to include a system for registration of the Danish legal deposit, in a close cooperation between the two libraries responsible for the legal deposit (The Royal Library and The State and University Library) and Bibliotekscentralen, responsible for the National Bibliography for books. A function for control of the legal deposit will be established as well.

Furthermore the agreement expects to establish compatible library networks for the purpose of giving all Danish libraries access to the shared machine readable library resources, as well as making it possible to request ILL throughout the whole library community.

The school libraries in primary schools (covered by The Library Act) now wish to take advantage of library automation for more than just information retrieval in BASIS due to the introduction of stand alone PC systems in the schools. By the end of 1990 at least 250 schools out of 1800 had acquired systems.

REPORT

1.0 DATA COLLECTION

1.1 Methodology

For desk research data material from various sources has been available: Official statistics for academic, public and school libraries (ref. 1a-b). Danish library statistics are following Unesco principles, but not all libraries have submitted full statistics. Those libraries which have not sumitted statistics are mainly very small, so consequently the total figures for the libraries may be a little, but not much, too low. As the figures for 1990 were not available at the time of compilation, certain tables are based on 1989 figures. Other official information sources on the library IT have been used as well (ref. 2-5, 11).

The suppliers of library systems (or parts of library systems) have also been questioned for details about their business and their products. This questionnaire was sent to 25 companies, and 23 answers were received.

In addition to the information obtained in the ways mentioned, the academic libraries have likewise been approached regarding various information on their systems and expenditure. The questionnaire was sent to 177 libraries and 77 answers were received. Information from a questionnaire sent by FEK (The Computer Department of The National Library Authority) to the participants and users of ALBA/SAMKAT has been used to supplement the answers, giving further data for another 50 libraries. Thus direct information was collected from 71% of the academic libraries. The libraries from which answers were not received were all very small and moreover we knew beforehand which were ALBA/SAMKAT users or participants.

Furthermore we have been using material which is being reported each October from the public libraries concerning their computer application. In October 1990 244 of the 250 libraries sent in their reports. (See Annex 4 for the questionnaires).

Some of the answers have been double-checked by making comparisons between information received from the various questionnaires. On the basis of the sub-groups of the statistical tables it has been possible to interpolate the figures from the library questionnaires when necessary.

Much information has been obtained during visits to libraries and demonstrations of their systems. Moreover information has been gathered by studying the manuals, help screens etc of the systems. Information on size and contents of databases and library catalogues has often been found in this way.

Information on new IT-based user services have been gathered

during visits, by reports in the two main user groups (see ref 23, 25), and from the annual reports of experimental projects in public libraries. Individual reports of these experiments have been studied as well.

The Royal Library as well as FEK (The Computer Department of The National Library Authority) have been kind enough to do a special run in their systems to find breakdown figures on coverage in the library catalogue and in ALBA/SAMKAT.

It is to be stated that the library situation is so dynamic these years that figures given in one section of the report may have changed when the next section was written. For contents of databases it is not always possible to reproduce the figures from an earlier data.

A few persons who are not working in the libraries or in the supplier companies have been interviewed to get further information on special areas (see Annex 2).

1.2 Basic statistical data

Basic statistical data are given here, to the effect that figures in the report may be seen in relation to these.

1.2.1 Academic libraries

Statistical grouping

The academic libraries in Denmark are for statistical purposes grouped according to their main functions (1989):

A National Library:	1	
B University and higher education libraries:	18	
C Other educational libraries:	62	
D Special institutional libraries:	2	
E Special libraries:	99	
a total of	179	academic libraries.

Moreover the university institute libraries (278) are regarded as academic libraries, but they are very small and not included in the main statistical tables. Most of these institutes have less than 1/2 f.t.e. employed, but there are a few institute libraries with 2-3 f.t.e's.

The 20 largest libraries

For many purposes, though, a group of the 20 libraries holding stocks of books and periodicals exceeding 100.000 volumes seems to be the most important. 12 of these are in groups A and B above, 1 in group C, 1 in group D and 6 in group E. These are also the libraries in which automated library housekeeping functions have been most extensively implemented.

Some statistical figures for these 20 large libraries compared with the group of all academic libraries, 179, are given below, based on 1989 figures:

Table 1.1

Academic libraries	All	20 largest	Pct of all
Number	179	20	11
Stock (million):			
books and serials publications	14.5	12.2	85
all materials	46.2	26.2	57
Loan (million):	3.1	2.29	73
ILL (million):			
total	0.42	0.38	91
to foreign countries	0.035	0.034	96
Staff f.t.e.	1586	1238	78
Expenditure (mill. DKK):			
library materials	104.7	81.8	78
total	495.8	423.0	85

For further details of the 20 large academic libraries, see below, tables 3.1 and 3.6-8.

1.2.2 Public libraries

Denmark is divided into 275 local authorities with an average size of 20.000 inhabitants. Each is obliged by the library act to run a public library. This may be done through cooperation between several local authorities. Therefore the country is covered by 250 library systems with approx 1000 service points and 70 mobile libraries.

There are eight large library systems, Copenhagen, Frederiksberg and Gentofte in the metropolitan area, and 5 provincial towns: Århus, Aalborg, Odense, Randers and Esbjerg.

A network of county libraries "Centralbiblioteker" serves as a superstructure for the individual library systems. There are 14 counties plus the cities of Copenhagen and of Frederiksberg. Of the above mentioned libraries only Randers is not a county library.

Public library statistics, 1989 figures:

Table 1.2

Population served		5.1 million
Total expenditure 1990	1.900	million
Administrative units	250	
Service points	1.000	
Mobile libraries	70	
Also served: Hospitals	92	
Health care inst	1.200	
Kindergartens	5.700	
Some 1989 figures:		
Total stock of books	35	million
Circulation of books	78	million
Talking books	0.4	million
Recorded music	2	million
Other recorded sound	0.2	million
Total circulation	86	million
Staff in full time equivalents	5.800	
Of which librarians	2.400	

1.2.3 School libraries

The Danish library act makes it mandatory for each local authority to provide library services in the schools for primary education. There are 1800 schools nationwide.

Table 1.3

Number of primary schools	1.800	
Books in stock	21	million
Audiovisual units	0.5	million
Annual circulation	37	million
Book sets	11	million

2.0 STRUCTURAL CHANGES

Before reporting on actual developments in the use of information technology, the changes in the structure of the organizations and the legal reforms which greatly influences the situation and the working conditions of the libraries should be briefly described.

2.1 Changes in the organisations

2.1.1 Statens Bibliotekstjeneste

As of January, 1st, 1990, Statens Bibliotekstjeneste, (SBT, Danish National Library Authority) - formerly Rigsbibliotekarembedet (Office of the National Librarian), - is the official body responsible for governmental relations to the public libraries and also acts as advisory body to the Ministry of Culture and the academic libraries. SBT is an institution affiliated to the Ministry of Culture, and headed by the National Librarian. It carries out functions concerning libraries affiliated to other ministries as well. IDE (Danish Institute for International Exchange of Publications) is also part of the institution, as is Forskningsbibliotekernes edb-kontor, (FEK, The Computer Department of the Danish National Library Authority).

In 1989 Statens Bibliotekstjeneste was appointed **National Focal Point** for the EC action plan for libraries by the Ministry of Culture, and at the same time a cooperation with DANDOK in the reference group REFBIB was established.

In Denmark the term academic libraries or research libraries is used for university libraries (including the National Library), other higher education libraries and special libraries altogether. Libraries of institutions for further non-university level education such as technical schools, teachers' training colleges and business schools are not necessarily considered academic libraries all of them, but their acquistions may eventually be incorporated in the academic libraries' database system and they will be able to participate along with academic libraries in the central system of these.

2.1.2 Nationalbibliografien (Danish National Bibliography)

As regards The National Bibliography (produced partly by Bibliotekscentralen, (BC, The Danish Library Bureau) and partly by KB (The Royal Library) a change has also occurred, the National Bibliography now being produced under a state contract, and with Nationalbibliografisk Råd (Council for National Bibliography) advising Rigsbibliotekaren (the National Librarian) in the fields of bibliographic level, comprehension and so on.

2.1.3 Information policy

The Ministry of Culture has asked the National Library Authority to draw up a proposal for a Danish Information Policy to be discussed in relevant fora, clear definitions of national information policies being seen as a means to improved cooperation at the National as well as at the European level. Hearings on the draft plan are now going on.

2.1.4 The Danish Public Lending Right

According to a new law concerning this area the administration of the payment to Danish authors according to the number of volumes present in public libraries and school libraries will after a transition period be computerized right from the basic counting to the final payment. This makes it necessary for all public libraries and school libraries to convert their holdings into machine readable form. The administration is part of SBT, and the bibliographically based system is called BIA.

2.2 Extended cooperation between the Danish public and academic libraries

The most recent development in the Danish library sphere is the negotiation between FEK and BC, which took place during the past few months of 1990 and which resulted in an agreement to work together to the effect that the Danish library community may in the course of the next few years see a joint database with a common input system, i.e. an integration of the next generation.

This will mean a shared input system, a shared database containing both the national bibliography and the holdings of academic as well as public libraries, and a shared ILL system. Furthermore there will be network access to the system from all libraries, with connections from all libraries to the DENet. This cooperation is called DANBIB.

In a report from a working group of SBT the two legal deposit libraries (pligtafleveringsbibliotekerne) and Bibliotekscentralen agrees to the establishing of a central database for registration of legal deposit as part of DANBIB. The BIA system mentioned above may eventually form part of DANBIB.

3.0 MACHINE READABLE RECORD RESOURCES

There are now several machine readable record resources in the Danish library system, although there is a certain amount of overlap between these. The categories differ from those of the contract specifications.

Production of the national bibliography:

Danish national bibliography for books (1970-), articles (1981-), recorded music (1984-), audiovisual materials (1980-)
Bibliotekscentralen

Danish national bibliography for periodicals (1988-), maps (1990-), and printed music (1990-)
The Royal Library

The National bibliographic records are to be found in the online accessible databases BASIS, ALBA/SAMKAT and Artikelbasen (only the articles). Records are reused for library catalogues.

Production of value added records for the public and school libraries
BASIS

The union catalogue of foreign literature in the academic libraries (1979/80-)
ALBA/SAMKAT

The union catalogue of foreign literature in the public libraries (1972-)
BASIS

Individual library catalogues are to be found in individual library systems as well as in ALBA/SAMKAT as separate databases.

3.1 The Danish National Bibliography

3.1.1 Organisation

As mentioned above the Danish National Bibliography has undergone a radical change as regards organization and financing. The monographic part: Dansk Bogfortegnelse was computerized in 1976 and Bibliotekscentralen continued to do the work (in cooperation with the Royal Library) but at that time also acquired the publishing rights.

3.1.2 Government responsibility

An investigation concluded in 1985 that the government was to accept the responsibility and indeed pay, for the monographs parts as well as for the other parts produced by Bibliotekscentralen: Recorded music, audiovisual material,

films, articles in periodic publications etc, but that this should be coordinated with the parts done by the Royal Library: Periodic publications, maps, sheet music and Dania Polyglotta (Danish publications published abroad).

The responsibility is now with the Ministry of Culture. The administration and coordination rest with SBT. In order to safeguard all interests the National Bibliographic Council was set up. The government financing covers the costs of preparing the 'manuscript' and storing the data. The costs of publishing and utilising data are to be covered on a commercial basis.

One of the major issues has been to secure public access to national data without any hindrance in the form of copyright or other barriers. The objective has also been to improve cost efficiency and to make some reductions in a coordinated way so as to secure the integrity of the national bibliography's role as a registration of the nations literary production and as a bibliographic resource for the libraries.

The total costs of producing the national bibliography in 1991 are DKK 15 million.

The national bibliographic records are produced according to the Danish cataloguing rules based on AACR2 and the DK5 classification. The character set has been agreed between BC and FEK (extended ASCII, 7-bit) and the records may be presented in the DANMARC format, closely resembling UKMARC. Both BASIS and Artikelbasen are able to export MARC records.

3.1.3 Use of the data

All data from BASIS can be used via download or via off line delivery in various forms, e.g. a weekly list on diskette. The delivery form conforms to accepted standards and is described in a published manual. The price is DKK 0.75 pr record + handling costs.

All national bibliographic data produced by The Royal Library may be downloaded from the REX system. Off line delivery can be negotiated.

Exchange of machine readable national bibliographic data with other countries is the responsibility of FEK.

3.2 ALBA/SAMKAT

The shared system of the academic libraries is called ALBA/SAMKAT. SAMKAT is the name of the cooperation in the input of catalogue records (SAM = CO, KAT = CAT). ALBA (Accessionskatalogens Localisation BAse) is the total system of records for locating materials and for reuse of records, including the SAMKAT, and the multiMARC data (see below). FEK is responsible for ALBA/SAMKAT. (see section 8.3.2 for details of FEK).

3.2.1 ALBA/SAMKAT as a resource

As the Union Catalogue for the academic libraries ALBA/SAMKAT is still the main source for finding the newer books and the periodicals held in these libraries, and it is at the same time an important cataloguing resource for the academic libraries participating in SAMKAT.

The cooperative system producing this resource has changed considerably during the last few years as the majority of records is now sent to ALBA in batch operation.

3.2.2 Size and contents of ALBA/SAMKAT

The records found in ALBA/SAMKAT at the beginning of 1991 have been supplied from various sources:

1. By direct cataloguing into ALBA/SAMKAT, usually with the input system FELIX (ref 7); nearly 50 libraries are doing this,
number of records 240.000

2. By transfer of records catalogued in the local library system to ALBA/SAMKAT batchwise
a) from libraries importing records from ALBA/SAMKAT for reuse (10 libraries),
number of records 1.500.000
b) from libraries not importing from ALBA/SAMKAT, but only exporting records to the central system (32 libraries)
number of records 250.000

2a) and b): About 250.000 of these records are produced by agreement for other institutions (particularly from nearly all of the 278 university institute libraries),

3. By conversion in the office of the ALBA editors of catalogue cards received from libraries without an automated cataloguing function. The records include library location, but no shelf mark. This conversion is to be discontinued from 1991
number of records 280.000

4. By import of records, weekly received on tapes:
a) Danish national bibliographic records from Bibliotekscentralen 1976- (194.000)
b) National bibliographic records from BL and LC 1981- (1.540.000), reformatted to DANMARC
c) the ISDS-file, reformatted to the DANMARC format (493.000)
d) NOSP holdings data for Nordic libraries, a)-c) include no library location, but records from d) are automatically merged with ISDS records for matching ISSNs (94.000)
number of records 2.300.000

Total number of records in ALBA/SAMKAT 4 1/2 million

Records with the same ISBN are clustered in ALBA/SAMKAT

Standards

Records in ALBA/SAMKAT follow the DANMARC format, which is very similar to the UKMARC, and the exchange format is ISO 2709 - Danish version DS 2162.
The character set is an extension of the ASCII 7-bit character set.
The cataloguing is according to the AACR2. For 1 and 2 the level of description for original cataloguing will be below national bibliographic level.

The retrieval system in ALBA/SAMKAT is according to the Danish standard DS 2347, equivalent of ISO 8777 with small variations.

The main contributions to ALBA/SAMKAT are records from the largest academic libraries:

TABLE 3.1

Library Acronym ***)		Stock "Books"	Periodicals subscriptions	Machine readable records in ALBA		% m.r.r. **)
KB	2a	3.3 mill	43.000	530.000	L	*)
SB	2a	1.9 -	24.000	230.000	L	24*)
ABA	1	0.15 -	2.000	5.000	x)	3
Bot	1	0.12 -	0.900	0.200	x)	<1
DBi	-	0.12 -	1.600	17.700	x)L	24
DNLB	2a	1.3 -	8.700	75.000	L	11
DPB/DLB	1	0.8 -	6.000	94.000	L	25
DTB	2b	0.7 -	5.500	77.000	L	*)
DVJB	1	0.4 -	4.200	30.000		15
DStat	1	0.19 -	4.300	1.500	x)	1
FBO	2b	0.21 -	2.000	?	x)PL	
HBK	2b	0.27 -	4.900	120.000	L	89
HBA	2a	0.14 -	2.900	12.000	PL	17
KGB	1	0.17 -	0.300	7.000		8
KAB	1	0.15 -	0.400	.100	x)PL	<1
NatMus	1	0.24 -	1.600	17.000		14
OUB	2a	0.9 -	8.400	124.000	L	27*)
Risø	2b	0.3 -	1.500	23.000	L	15
RUB	2a	0.4 -	6.000	210.000	L	100
AUB	2a	0.4 -	9.400	180.000	L	100

Legend to table 3.1:

The libraries marked with an L have a local system of their own as well; PL is part of a local system.

x) further records for these libraries may be found among the ALBA records (3.2 pkt 4) not yet transferred to the individual library database in ALBA/SAMKAT.

*) For these libraries se below, local systems 3.7

**) m.r.r. means machine readable records. The percentages of m.r.r. have been estimated on the basis of the observation that 3 libraries with 100 machine readable records, namely Roskilde and Aalborg university libraries and the University Library, Amager (now part of The Royal Library) have machine readable records for the entire stock, and have a number of records which is close to 50% of the number of volumes in the library.

This may be explained in the following way:
Danish academic libraries as a principle have one copy per title (a small proportion of the books is duplicated for the reading room collections),
multivolume publications have on average 1.15 volumes per record, and
one periodical subscription is covered by one record, but will consist of many volumes. The libraries usually give no figures for which proportion of volumes in their collections is coming from periodicals.

***) The library acromyms may be seen from the list below:

The National Library: The Royal Library
(KB, Det Kongelige Bibliotek)

The State and University Library
(SB, Statsbiblioteket, Århus)

The Labour Movement Library and Archive
(ABA, Arbejderbevægelsens Bibliotek of Arkiv)

Central Botanical Library of The University of Copenhagen
(Bot, Botanisk Centralbibliotek)

The Library of the Royal School of Librarianship
(DBi, Danmarks Biblioteksskoles Bibliotek)

The Danish National Library of Science and Medicine
(DNLB, Danmarks Natur- og Lægevidenskabelige Bibliotek)

The National Library of Education
(DPB/DLB, Danmarks Lærerhøjskoles bibliotek og Danmarks pædagogiske Bibliotek)

The National Technological Library of Denmark

(DTB, Danmarks Tekniske Højskoles Bibliotek)

The Danish Veterinary and Agricultural Library
(DVJB, Danmarks Veterinær- og Jordbrugsbibliotek)

The Library of Danmarks Statistik
(DStat, Danmarks Statistiks Bibliotek)

Library and Information Service of the Danish Parliament
(FBO, Folketingets Bibliotek og Oplysningstjeneste)

Library of the Copenhagen Business School
(HBK, Handelshøjskolens Bibliotek, København)

Library of the Aarhus Business School
(HBA, Handelshøjskolens Bibliotek, Århus)

The Royal Military Library
(KGB, Det Kongelige Garnisonsbibliotek)

The Library of The Royal Academy of Fine Arts
(KAB, Kunstakademiets BIbliotek)

The National Museum. The Library
(NatMus, Nationalmuseet, fællesbibliotek)

Odense University Library
(OUB, Odense Universitetsbibliotek)

RISØ Library, RISØ National Laboratory
(Risø, Risø Bibliotek)

Roskilde University Library
(RUB, Roskilde Universitetsbibliotek)

Aalborg University Library
(AUB, Aalborg Universitetsbibliotek)

After the acronym in table 3.1 is given the number of that part of ALBA/SAMKAT in which the contribution of the library is categorized.

The number of records input by SAMKAT participants has doubled since 1987 (about 900000 records in 1987, now more than 2 million records). In 1988 FEK launched a campaign to encourage as many as possible of the academic libraries to participate actively. The campaign was deemed a success but some libraries - accounting for the last five percent or so of the acquisitions of the academic libraries - are still non-participants. Therefore a new campaing is planned for 1991.

3.2.3 Coverage

The main part of ALBA is records for book materials printed during the last decade or so (1979-), but a small proportion are earlier publications acquired during the eighties or publications of the few libraries which were producing machine readable cataloguing before SAMKAT started. Coverage by year differs from one library to another.

3.2.4 Contents by naterials

Materials other than books and periodicals only account for a very small amount of the records input in ALBA/SAMKAT, as seen from the following table (Figures from the end of may, 1991, imported records not included):

Table 3.2

Type of records	number of records	% of total
Monographic	2.220.935	89
periodicals	162.434	6
analytic	22.952	1
references	100.694	4

Among the monographic records are:

Table 3.3

Type of material	number of records	o/oo of total
Printed music	10.003	4
Music mss	2	-
cartographic	456	0,2
audio visual	649	0,3
microforms	338	0,1
electronic, machine readable	4	-

3.2 4 Direct and batch input

As said above 50 of the academic libraries are producing records directly to ALBA/SAMKAT, using the FELIX software, developed by FEK (ref. 7). Those libraries which have local library systems are cataloguing their materials into the local system - with or without reuse of data from ALBA/SAMKAT - and transferring the resulting records batchwise to the ALBA/SAMKAT system. While in 1986 nearly all libraries participating with machine readable records were cataloguing directly into SAMKAT, now 80% of the

records sent to ALBA/SAMKAT are sent batchwise, usually as MARC tapes, but online file transfer with the TCP/IP protocol (FTP) is possible as well.

The percentage of reuse has decreased somewhat during the last few years, from about 60% to about 50%. One of the reasons for this may be the fact that many of the libraries enter records at the stage of ordering the material, even when the system does not have a fully developed acquisition function. The need for national bibliographic records to be found in the system as early as possible is therefore evident.

3.2.5 Reformatting of older records

The two pioneering libraries, DTB and HBK, which began machine readable cataloguing as early as the 60'ies - at which time the MARC format had not yet started its conquering tour of the world - have had their files of catalogue records reformatted to the danMARC format. They are now regular participants of the ALBA/SAMKAT system and all their records are included in ALBA.

3.2.6 Card conversion and input (ALBA editors)

Since 1980 the catalogue cards received by Accessionskatalogens redaktion (the administration of The Union Catalogue), from libraries still doing traditional cataloguing, have been edited and input in machine readable form in ALBA by the editors' office. This duplication of effort is no longer possible and the libraries concerned will therefore be encouraged to do the machine readable cataloguing themselves. The bibliographic level of these records is below that of the cataloguing to SAMKAT.

3.2.7 Imported catalogue data

Tests have been made in order to include other national bibliographies, for instance the Norwegian and the German ones in ALBA/SAMKAT, but so far no contract has been signed with any of these.

3.2.8 Availability of data from ALBA/SAMKAT

In principle, the machine readable records belong to the producing libraries, which can get them for their own use, free of charge. FEK offers **MARC tapes for local library catalogues** when these are established. SAMKAT participants are able to **download single records or retrieved sets** from ALBA.
Lists of the periodical records of an individual library may also be produced. FEK is doing the selection, while the list production itself is done by UNI*C (The Danish Computer Centre for Research and Education). UNI*C charges for the printing, while the selection by FEK is free of charge.

ALBA has been produced in microform since 1983. The microfiche catalogue was an accumulated edition of the records for foreign literature in ALBA/SAMKAT which could be considered a continuation of the printed book union catalogue produced since

1901. This production is now discontinued, the last edition being that of 1989.

3.2.9 Use of ALBA/SAMKAT

Besides being a major cataloguing resource, the ALBA/SAMKAT system is extensively used for retrieval and information on location of library materials both by the academic and the public libraries, for locating library materials in the academic libraries. The retrieval system is the Danish equivalent of ISO 8777, DS 2347.

ALBA users		
Academic libraries	396	63% of users
Public libraries	85	14% - -
Private libraries etc	78	12% - -
Non-Danish users (mostly Swedish)	69	11% - -
	628	100% of users

Connect hours in ALBA at the end of 1989: 358 hours per day,
while the use in 1986 amounted to 167 hours per day.
Growth from 1986 to 1989: 114%

3.2.10 Pricing policy in ALBA/SAMKAT

Active participants in SAMKAT are free to reuse the records of the ALBA/SAMKAT database, and the searches necessary in the cataloguing process are free as well. They may also, as mentioned above, have their own records delivered free of charge, on tape or by downloading or file transfer.

Use af ALBA for locating documents has to be paid for. The price has come down gradually over the years, at the end of 1990 it amounted to about 40 DKK pr connect hour, with a reduction for late hours and a large rebate for users with more than 300 connect hours pr month pr institution (down to 5 DKK per hour).

Telecommunication costs and local equipment is the responsibility of the libraries themselves.

Direct costs of the ALBA/SAMKAT paid to UNI*C in 1989 for storage and maintenance were DKK 6 million (+VAT 22%) of which the users covered 23%. 1990 figures are not yet available. Most of the development work is done by the staff of FEK (The Computer Department of the National Library Authority).

3.2.10 Hosts of the databases

3.2.10.1 ALBA/SAMKAT as a host

Furthermore the ALBA/SAMKAT system now hosts some other databases, which are not entirely bibliographic: The GATT database (Danish Standards, centrally input), the DANDOK database (18 institutions making input) with the results from

Danish academic research institutions (ongoing projects, as well as reports, books and articles) and the Scannet database (containing information of 446 Nordic databases). These databases may be accessed by any user of ALBA/SAMKAT who can choose them from the menu, but they cannot be used free of charge. For DANDOK the charge is 200 DKK an hour for the first 30 hours in a three month period, followed by a considerably lower rate for further use.

3.2.10.2 UNI*C hosting ALBA/SAMKAT

The ALBA/SAMKAT system itself is hosted in the Unisys 2200/444 (OS1100) computer owned by Uni*C. The cooperation between FEK and Uni*C is based on a contract, the present one expiring by the end of 1993.

3.3 MINIBIB

The cataloguing of a group of now 17 governmental department libraries to a shared cooperative catalogue on a RC 8000 computer is called MINIBIB. The computer is based in Det administrative Bibliotek (The Administrative Library) and the system now holds nearly 100.000 records (the total stock of the participating libraries is about 500.000 vol of which 20% is foreign literature). One of the libraries, FBO, is among the 20 largest libraries, and except for Det administrative Bibliotek with 94.000 records, the others are small institutional libraries of governmental departments, statistically categorized as special libraries.

According to the agreement the 20% of the records covering foreign literature are to be transferred to ALBA by tape. The descriptive level of these libraries will typically be somewhat lower than the level of SAMKAT participants in general. The standards for format and character set are the same as for SAMKAT, although there may be slight deviations. The retrieval system is according to ISO 8777.

About 50 external users have passwords to MINIBIB. Access to MINIBIB is somewhat more expensive than access to ALBA at the moment (200 DKK pr hour), but a fall in price is expected soon.

3.4 BASIS

3.4.1 The system

BASIS has been mentioned already. It is a multi-purpose database hosted by Kommunedata in their Aalborg plant. Technically speaking it is running on 3 almost identical installations due to the demand. These are RC International RC 8000/RC 9000 computers. The system is a Kommunedata improvement and enlargement of the RC International RC-Lib.

Searching is according to ISO 8777. The system operates on 3 levels: The bibliographic record level, the library location level and the library holdings level. The first 2 levels are

available to all users. The third only to the owner library. About 150 public libraries are connected to BASIS with more than 600 terminals at the end of 1990. During 1991 an increase of 10 more libraries and 300 terminals is expected. Most usage today is simple search and retrieval of bibliographic information as a general reference resource. BASIS is, however, also used as a resource for ILL even if no automated ILL module is connected. Some libraries use other types of services from Kommunedata and store their holdings directly in BASIS. Some libraries with local systems only indicate that they own a specific title.

Unfortunately some libraries with local systems from suppliers other than Kommunedata have not found ways to mark their holdings in BASIS. This represents an obstacle for one of the major BASIS functions which is to serve as a union catalogue for the public libraries. Measures are taken to try to overcome this. Such measures may, however, be made obsolete by the DANBIB concept.

3.4.2 The BASIS contents

BASIS is the source for national bibliographic records produced by Bibliotekscentralen. In BASIS most of these records have value added information for public library and school library use.

Table 3.4

Contents of BASIS, in records

Printed books and serials			597.339
of which:			
National bibliography. Books, 1970-		186.457	
Foreign titles.	Fiction	63.011	
from 1972	Non-fiction	145.016	
- -	Children	34.052	
Serials in public libraries		25.000	
Recorded music			56.516
of which:			
National bibl. recordings 1984-		6.102	
Printed music			49.256
Audio-visual media			37.728
of which:			
National Bibliography 1984-		15.335	
Total number of records			740.839

3.5 Artikelbasen

3.5.1 The system

Artikelbasen is a host system at Bibliotekscentralen for the national bibliographic database on articles in serials. Some 800 journals and 10 newspapers are indexed. Only articles exceeding 6000 characters are indexed.

The cataloguing is processed on a rather old in-house Honeywell Bull system. The information is tranferred to the host system on a RC International RC8000 at Bibliotekscentralen. This device is also used for batch processing and for the production of paper-based bibliographic products. The system is RC-Lib in straight forward original form. The command language is ISO 8777.

3.5.2 Use of artikelbasen

Artikelbasen aims at users in all library sectors and also users in other areas such as: Business, administration and education. The manuscript costs are covered by the state grant, but all costs of publishing the data (in printed form and in database form) will have to be covered on a commercial basis.

Some figures

Table 3.5.

Number of records (1981-)	300.000
Users (number of passwords):	
Public libraries	97
Academic libraries	78
Others	25
Average price per command	DKK 2.53

3.6 Local library catalogues in academic libraries

While only very few academic libraries and no public libraries at all had operational local library systems in 1986, an increasing number of these is now being established. By the end of 1990 11 local library catalogues of considerable size were operational in academic libraries. These were KB, SB, DBi, DNLB, DPB/DLB, DTB, HBK, OUB, Risø, RUB, AUB. At least another two higher education libraries are now under way, the funding for these having been secured.

For the large library catalogues which contain significant amounts of special library materials the contents are described in more detail below.

Table 3.6

The Royal Library: Contents and coverage: Records in the REX database.

Material	Collection size (vol)	m.r. from	Records
Slotsholmen			
Foreign literature	1.200.000		
books		1980-	180.000
periodicals		1950-	28.000
Danish literature	1.000.000		
books		1980-	154.000
periodicals		1960-	29.000
International publ.	200.000		
books		1985-	7.500
periodicals			2.000
Printed music	230.000		
Danish		1972-	7.000
foreign		1975-	11.000
periodicals			17
Orientalia (- Judaica)	50.000		
books		1987-	11.000
periodicals			379
Judaica	60.000	-	-
Incunabula	4.500	-	-
Postincunabula	6.500	-	-
Cartographic material	250.000	1990-	239
Manuscripts		1990-	237
Portraits, pictures, etc	10.000.000	-	-
University library, Danish and foreign	800.000		
Fiolstræde, books		1982-	36.000
periodicals			1.000
Amager, books		1975-(all)	63.000
periodicals			1.600

These figures include records transferred from ALBA, converted by ALBA editors from printed cards produced by The Royal Library before 1980 (section 3.2: ALBA/SAMKAT part 3).

The library system of The Royal Library includes a base 2 as

well, called REGINA, with analytical material of Danish legal bibliography (10.500), music manuscripts (4.000), and records from retroconversion experiments (25.000).

Moreover the REX system hosts the records from university institute libraries of the faculties of humanities, social sciences and theology of The University of Copenhagen, from Kvinfo and from The Library of the Royal Academy of Fine Arts. These records may be found in ALBA/SAMKAT as well.

Table 3.7

Contents of materials in REX:

Books	88%
periodicals	9%
printed music	3%
cartographic materials	0,5 o/oo
manuscripts	0,5 o/oo

Collections of the large academic libraries DTB, OUB, SB

Table 3.8

Library acronym	Collection size in vol.	mr.r. from year	records
DTB			
books	285.000	1968-	126.000
		-1968	20.000
periodicals	400.000		14.000
OUB	900.000		
books		1987-	124.000
		-1987	30.000
periodicals			17.000
printed music	23.000	1987-	5.700
SB	1.900.000		
books	1.000.000	1979-	210.000
periodicals	750.000		17.300
printed music	118.000	1990-	3.000

In the local library system of The National Technological LIbrary, ALIS, a physical database 2 is found with 49.000 records for books and 1.100 for periodicals of institute libraries from the National Technological University Institutes as well as 30.000 records for books and 400 for periodicals of Technical

College Libraries. Moreover the local system contains 10.000 records for periodicals articles indexed. Only records from 1980- have so far been transferred to the ALBA/SAMKAT database.

In its local system, ODIN, OUB has 17.500 records of monographs and 3.000 periodicals records for institute libraries as well.

138.000 records for university institutes and other institutions cooperating with SB are held in the local system, SOL, but these records are at the same time one of the individual databases in ALBA/SAMKAT.
Further 5.900 records for Danish economic bibliography are found in the system as well.
For a period the SOL system was hosting the library catalogue of The library of Sydjysk University Center. It is still hosting the library catalogue of HBA which is now acquiring a system of its own.

The standards for cataloguing rules, format and retrieval language are the same for these library catalogues as for ALBA/SAMKAT. The character set for DTB is ISO 8859/1, though.

3.6.1 Cataloguing locally

The local library catalogues have been trimmed to accomodate local needs, particularly concerning subject retrieval. The central system may be regarded as a backup system for the local ones.

Further material may be found in the local systems, which may be the library's indexing to external databases of specific subject areas, or the library's indexing of serials articles etc for specific use in the local library catalogue.

3.6.2 Local retrieval

The local library catalogues are OPACs in that they are accessible to the users of the libraries (while that of the central ALBA/SAMKAT was originally designed to be used by library staff only). The retrival language used in these is ISO 8777, with the exceptions mentioned below.

The retrieval asystems in the libraries using BRS is not according to ISO 8777 and the three TINlib installations will be using a hypertext based retrieval system.

3.6.3 Help facilities

Several of the local system OPACs have more or less developed user assisting facilities, "help systems," making them comparatively self instructive.

3.6.4 Discontinuation of other catalogue forms

The card, microfiche or book catalogues which for some years were still being produced alongside the development of the OPACs have in the majority of cases been discontinued. While only temporary funds were available for a long period, FEK has now for seven years had its regular place on the budget of the Ministry of Culture and the libraries have themselves got funds for automation (even though in some cases in the form of loans from a ministerial pool). Therefore no academic library is any longer expecting to have to go back to a manual cataloguing system, and the online catalogue has been generally accepted as the catalogue form of today.

The two large libraries, The Royal Library and the State and University Library, Aarhus, both of which have extensive cataloguing responsibilities for libraries of university institutes, still produce cards to some institutes which have not yet fully changed to automated procedures.

3.7 Local library catalogues in public libraries

Public libraries shall only contain information covering todays needs. All titles held should in principle present the same value of actuality. Public libraries therefore have to convert all their stock in order to benefit from library automation. Consequently all 67 public library catalogues in development will cover all stock held in each library.

Most of these local systems have been created by download from BASIS. It is being debated whether the local library systems should contain only titles held locally or a smaller or larger subset of BASIS as well. In many cases it is a matter of costs and capacity. Anyhow, all libraries want the dual possibility of simultaneously having access to the local system and to BASIS.

3.8 CD-ROM production

Until now only one Danish CD-ROM with bibliographic data has been produced, called MAGNUS. This is a shared production of "books" on CD-ROM with legal information, tax information and information about public service. The Royal Library's share of this CD is 10 years of law bibliography (the printed publication is Danish Law Bibliography /ed. by Jens Søndergaard (1990 ed. by Lotte Jacobsen)). ALBA on CD-ROM is a project under way.

The Royal Library is one of the participants in the CEC supported IMPACT project of national bibliographies on CD-ROM.

A CD-ROM is under way from Bibliotekscentralen with records from the bibliographic publications of BC.

From Bibliotekscentralen a CD-ROM is under way as well, containing records from the bibliographic publications of BC.

3.9 The Booksellers' system

The Danish Booksellers' Association introduced some years ago an online system, primarily intended for the use of the members of the Danish Booksellers' Association. Its basis is the database built up since 1976. It is a Danish "Books in Print", holding 40.000 titles, about 90 % of the Danish books offered for sale. The record format (with fixed length fields) as well as the rules for the registration are different from those of the library records and are incompatible with these. It works on an IBM 400.

Another part of the system is an INFO-base with MARC records on a RC 8000 computer, which holds 10.000 titles of new publications since 1988. There is now an agreement with Bibliotekscentralen that the Booksellers' Association will be getting tapes from the Danish National Bibliography for books from the middle of 1991.

A third part of the system holds marketing information from importing companies for the booksellers, such as information of newly issued foreign translations of Danish books. In the mail box of the system it is possible for the booksellers to order these titles from the publishers.

A WAN (protocol VT 100) binds the 275 booksellers together in a closed network not accessible to others. A non-standardized "EDI" is used for transfer of orders. The system is mainly a publishers' system, and the stock control is decentralised. The total cost for a bookseller is about DKK 30.000 a year.

3.10 Retroconversion

3.10.1 National plan

Very few academic libraries have retro-converted more than rather insignificant amounts of their catalogue records, but an overall plan for the academic libraries is expected to be drawn up soon. The need for retroconversion is acknowledged at the national level as well as among the libraries themselves, which need the records for their circulation systems. Statens Bibliotekstjeneste (SBT, The National Library Authority) has cooperated with FEK and some of the academic libraries in experiments with optical character recognition.

A practical experiment with OCR/ICR-reading as well as automatic formatting of the 10.000 catalogue cards of one library (the Danish Pharmaceutical Library) is nearly completed. A Fujitsu scanner has been used with German software (IBS). A small Danish company, Synergi, has participated in this project, using Fujitsu equipment for the scanning.

3.10.2 Retroconversion in the academic libraries

The Royal Library which holds the largest and oldest collections in Denmark has been conducting experiments with retroconversion, both by direct keying of records from old handwritten registers and of more recent typed or printed cards. This library has cooperated with SBT in the experiments with OCR/ICR as well, but as yet no report has been published.
In Odense University library records for books wanted for circulation are produced daily by direct keying-in. Some 30.000 records have now been produced in this way.

Some other libraries have retroconverted minor parts of their cards, particularly for such books as are needed for circulation.

3.10.3 Retroconversion of The Union Catalogue of foreign books

At the end of 1991 FEK will have started scanning the older volumes of Accessionskatalogen (The Danish union catalogue for foreign books). The volumes will be read beginning with 1981, which was the last year edited from cards produced by traditional methods. Then the volumes will be read one at a time, moving backwards from that year. The scanner used is a Kurzweil 5200, and by this method about 500 pages a day may be read.

Accessionskatalogen is a book catalogue and the scanner will read total pages. Only little formatting will be done in the first phase, and the records are intended to form a separate database in ALBA. Here the information may be retrieved with the search system of ALBA/SAMKAT as full text retrieval.

Even though no further editing is planned for the first phase, this way of offering the information is expected to save time in the libraries, where older books now have to be located by looking through several annual volumes of the old printed Accessionskatalogen (1901-1981).

3.10.4 The Danish National Bibliography (monographs)

By means of a state grant for the years 1985-87 Bibliotekscentralen carried out a conversion into machine readable form of all monographic titles in the national bibliography from 1970-1975. Furthermore a rather important selection of older titles were converted. All together 100.000 titles were added to BASIS. The strategy aimed at retrospective conversion in the public libraries. It was estimated that this programme would provide a hit rate at title level in BASIS for most public libraries of at least 96%. Actual conversions since have proved that this objective has been reached.

3.10.5 Holdings in Public libraries

67 public library systems out of 250 have started conversion. Many more will follow in the next few years. Most of them use

BASIS as a source database either directly or by loading a copy or a subset into the local system. Bibliotekscentralen has also offered to do the conversion for individual libraries, but the potential of local systems is so large that there has been little response.

Commentary

The resources of bibliographic records have grown considerably over the report period, and so has the use of the central database systems. They are now invaluable sources for identifying and locating Danish and foreign library materials in the Danish libraries. However, further cooperative cataloguing systems have not emerged. To the contrary, more of the libraries have found their way into the shared system, even though the records of some libraries have had to be reformatted.

The trend during the latest 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 cooperation in the field of classification and subject terms in these libraries, and partly due to special wishes to accomodate 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.

The developing closer cooperation in the field of automation between the public libraries and the academic libraries may be expected to further a higher degree of standardization.

The need for retroconversion is realised particularly by those libraries which have introduced circulation systems, but only have part of their records in machine readable form. The need is less easily met in the academic libraries than in the public libraries, as the academic libraries have more titles, more old books, more books in different languages, while having less standardized records in the card catalogues than the public libraries do. The public libraries will find most of their titles in BASIS, and moreover they are able to use a common control number for easy identification of the proper record.

4.0 NETWORK ACCESS TO MACHINE READABLE RECORD RESOURCES

ALBA/SAMKAT is connected to the university network called DENet. The contract beween FEK and UNI*C stipulates, that FEK is paying a certain part of the modem and Datapak (X25 network) pools at UNI*C, and the ALBA users on their side get access to all library databases. Local library catalogues wishing to be connected to the DENet have to pay for this (The order of magnitude: DKK 30.000 pr year).

The public libraries are using the most common carrier used in local authority computing: The X21 public network and either a BSC or SNA protocol.

4.1 DENet

The DENet makes it possible to access all the databases in Denmark or indeed those other countries which are connected to the same network i.e. using the same network protocol, TCP/IP. According to the brochure FINDformation (ref 6) this network gives access to 16 Danish library catalogues and documentation databases, 8 Swedish, Finnish and Norwegian library catalogues and documentation databases as well as 33 in the USA.

The 8 large academic library catalogues on the DENet were at the end of 1990 those of **AUB** (at that time also hosting FISHLINE from 4 institutes concerned with literature on fishery etc), **DNLB, DTB, HBK, KB, OUB, SB** (also hosting HBA), and **RUB, moreover ALBA** (also hosting DANDOK, GATT, and Scannet) as well as the databases FOVU (projects on adult education), and PEPSY (Scandinavian pedagogical literatur).

This protocol is expected to be changed to OSI in the foreseeable future. During the second half of 1990 the 8 larger local library systems mentioned above were connected to the DENet. All these local library systems - as well as the satellite databases, which are part of their systems - are therefore accessible in the network directly or via the FIND menu set up by FEK in ALBA.

In this menu the user has the option of accessing one of the systems, or the ALBA/SAMKAT system where the great majority of the records found in all the local systems will be accessible at the same time.

The actively cataloguing SAMKAT participants have permanent connections to ALBA/SAMKAT and consequently are also connected to the DENet. Moreover the TCP/IP protocol makes file transfer from local databases to ALBA/SAMKAT possible.

BASIS and Artikelbasen will be accessible through the DENet by February, 1991, which means that they will become accessible to all the SAMKAT participants (and many others as well).

4.2 Public libraries and the DENet

Those public libraries which are ALBA users and are not themselves connected to the DENet may call ALBA by dial-up, X25 or X28. Most of them are, however, unable to communicate with the DENet, which cannot be accessed by the SNA/X21 protocol. Hopefully this may be possible in 1991/92. A new development is going to take place in 1991 when BC and the Depository Library for public libraries will be connected to DENet.

The public libraries in the county of Ringkøbing are planning a county wide network for libraries and others with a 64K bit communication also connected to the DENet. Apart from the existing TCP/IP the specification goes for implementing ISO 10160-63, the library OSI protocols.

4.3 Access to Artikelbasen and BASIS

The two central databases of the public libraries, Artikelbasen and BASIS, are as mentioned above accessible to the users by X21 and the IBM BSC or SNA/SDCL protocol on 4800 baud, by dial-up or by Datapak (X25 network). 1200 baud TTY connection is possible on dial-up lines. X21 with BSC or SNA is considered the cheapest way of access. This combination of protocol and carrier is also the common communication for all local authority data communication.

4.4 Access to local library catalogues

Besides through DENet, access to many local library catalogues may be obtained by dial-up. The number of ports to the local databases varies considerably from library to library, a few libraries having up to 64 access points.

The local systems use local area networks for their in-house work enabling users to access the database from several working places in the library.

4.4.1 Login and password procedures

In the publication FINDformation (see 6) the network addresses of all the Danish library databases and many foreign library databases accessible through the DENet are listed, and the Scannet gives information on all library databases, Danish as well as other Nordic databases (see also 31). To facilitate use one has to know the login procedures and passwords once the connection has been established as nearly all the systems require login procedures and/or passwords, even when the access is free of charge. Only a few of the databases themselves provide such information on login procedures when accessed. Login as well as logout procedures are unfortunately not quite standardized at the moment.

4.5 Teledata (Videotex)

Teledata, a service of the Danish tele companies (in 1991 to become one institution: TeleDanmark), offers access to many information sources, such as the electronic telephone book, company information of various kinds, a weekly advertisement paper, and some of the library databases: BASIS, SOL, REX, ALIS, as well as many other databases. Access is by dial-up or by X28. Teledata supports many different protocols (TTY, VT100, CEPT among others). The advantage to the libraries of being connected to the Teledata is obvious: the occasional user, who is only interested in ascertaining the libraries' holdings, may use Teledata, which takes care of the charging for use of the network. Only in case the user wants to be able to request books from the system, will s/he have to become a registered user of the library and will have to access the database of the library directly to be able to borrow books. In case of more regular use, the Teledata will be a relatively more expensive way of using the library database. No libraries are offering teledata as a service to the users.

4.6 Access to external databases

Academic libraries use external (commercial) databases for information retrieval to a wide extent. Usually these are accessed by dial-up or by Datapak. This also applies to some of the university institute libraries.

4.7 E-mail

In the DENet e-mail may be used, and actually this facility is used by the staff of Risø for the the discussions concerning the indexing work shared with other libraries (particularly in the United States) for an external documentation database.

E-mail is offered by RCInternational as part of the RCLib system, and the facility is used for internal communication between the participants in the MINIBIB system.

No library is offering this facility to library users.

Commentary

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 standardized network which at the same time gives access to other databases of relevance to the libraries, among these prominent Norwegian and Swedish databases. The TCP/IP standard of the DENet is supposed eventually to be further developed into an OSI standard. Further standardization work is needed in this area.

With X21 the public libraries have a very cheap way of accessing the central databases, BASIS and Artikelbasen, but they cannot without an extra effort access ALBA. A change will occur when a network is established in the DANBIB cooperation with the same technology as in the DENet.

The Danish tele companies (in 1991 merged n?to one company, TeleDanmark), expect this year to establish the ISDN net. The rapid development of the networks and the introduction of ISDN is expected to result in cheaper communications in the near future.

5.0 INTEGRATED LIBRARY HOUSEKEEPING SYSTEMS

5.0.1 Integrated systems

All housekeeping systems have as their basis the information database containing catalogue records. Some of the systems operating in Danish libraries are very close to full integration. Breakdown on systems offered by suppliers and systems modules implemented are shown in table 5.4-7. A description of the main suppliers will be found in section 8.

5.0.2 Concepts of local systems work

In libraries with local systems of their own the attitude towards the developmental work varies.

In some of these libraries, adjustment of the aquired system as well as the development work has taken place in a special section, and the library staff has been involved in project groups only. In other libraries more decentralization of the work has been seen, and the staff has been involved to a higher degree in the design of their own working situation.

Very good results have come from library staff members working closely together with the supplier company in systems development. This has been the case for instance in RISØ library, in Herning, and in The National Technological Library.

5.1 Academic libraries

5.1.1 The large libraries (LA in the tables)

8 of the largest academic libraries had at the end of 1990 local systems with installations of about 40 terminals/-workstations or more (up to 230). These are (acromyms): KB, SB, DNLB, DTB, HBK, OUB, RUB, AUB. Figures for modules implemented in these libraries and the other academic libraries are given in table 5.2 below.

5.1.2 Middle sized and small libraries (SA in the tables)

A great proportion of the remaining academic libraries (159) have automated the cataloguing function, using various kinds of commercial software (see table 5.2) or using the FELIX input system, developed by FEK and the communication software, FEKCOMM, likewise developed by FEK. Those libraries which have a staff of 1 or 2 or even fewer members, typically have 2 terminals or 1 workstation and a terminal for the users.

Many of these libraries use the equipment for searching external databases as well as for word processing and statistical work. Some of them use database software packages for instance for bibliographic work.

5.1.3 Libraries of university institutes (UIL)

The majority of these libraries have 1 PC each and the IT equipment is in some cases used for information retrieval in commercial as well as in library databases, often for word processing or spread-sheets, for producing newsletters or for statistical work. So far these small institute libraries have not felt the need for automated housekeeping routines. Most of the PCs are now being connected to the DENet, and thus will be able to search ALBA as well as the local databases for literature wanted for ILL. In case these institute libraries should in the near future want the records of the library for a local online catalogue, downloading from ALBA will be possible.

Equipment in the institute libraries is usually either IBM compatibles or RC equipment. Various software packages are being used and the investment totals an average of DKK 50.000 or less pr PC installed.

5.1.4 Impact of automation

The impact of automation in the academic libraries may be indicated by the following estimates for the 179 libraries taken as a whole:

Table 5.1

Participating in ALBA/SAMKAT, directly or indirectly:	93%
Using ALBA for locating materials:	98%
ILL through ALBA:	8%
Local retrieval system:	45%
Operating circulation system:	7%
Local library catalogue in DENet:	5%
Acquisition:	3%
Serials system:	6%

Breakdown of the applications implemented:

Table 5.2

Library type	i/o MARC	cat/retr	circ	acq*)	ser**)
LA	15	15	10	7	7
SA	100	60	5	0	6

Legend to table 5.2: i/o MARC: the system (or the library, in case it does not have a local system but is cataloguing directly to ALBA) is able to import and export MARC records. cat/retr: the system has local cataloguing and retrieval modules,
circ.=circulation,
acq.= acquisition, *) With one exception, DTB, the acquisition function is not part of the systems delivered by the supplier. In the other systems mentioned, the records are entered into the system when books are ordered from the supplier and orders may be written out automatically by a report generator while some software package is used for acoounting. The cataloguing is completed when the book is received by the library.
ser = serials control, **) With the exception of DTB the library systems supplied have not yet included the serials control function. The other libraries have used a serials control system from the company DC Informatik and this is not fully integrated into the all of the systems.

As Danish academic libraries have subscriptions for series in many languages they tend to use various suppliers in the countries of origin for their serials subscriptions. None of them have introduced the automated serials systems known in other countries.

A handful of academic libraries use the software package BC-Fjernlån from Bibliotekscentralen to manage their interlibrary loans.

Moreover it should be mentioned, that in many libraries database software has been acquired for use by subject specialists, for instance in connection with acquisition of books and serials for special bibliographic work. E-mail, too, is a facility implemented in some libraries, for instance the MINIBIB group, for the internal communication of the group.

All academic libraries have to provide input of administrative data for the systems of The Ministry of Finance, SCR and SCL (Statens Centrale Regnskabssystem and Statens Centrale Lønanvisning), but there is no connection whatsoever between these systems and the library systems as such.

5.2 Public libraries

Impact of automation in public libraries

Table 5.3

Number of library systems	250
Libraries using BASIS	155
Terminals to BASIS	930
Libraries using ALBA	84
Libraries using Artikelbasen	97
Libraries completing local systems	54
Special grant for local systems	18
Libraries with circulation control	42
Decentralized cataloguing to BASIS	25
Other in-house bibliographic systems	28

54 library systems will during 1991 be completing their retrospective conversion and of these 42 will have circulation systems in operation. It should be observed that these figures were reported from the local authorities in October 1990. Since then a special state grant has been offered for retrospective conversion in smaller libraries, both school libraries and public libraries. 180 library systems applied but resources only allowed grants for 36 proposals, half of them school libraries, the other half public libraries. Apart from the 18 new library systems outside the October reporting this scheme has enlarged the general interest in library automation in public libraries and school libraries. It is estimated that a number of library systems apart from those already known will start library automation in 1991. The special state grant scheme will be continued in 1992 and 1993 - if funds are available.

The 28 libraries using other systems for secondary bibliographic purposes, such as local reference purposes, calenders of local events etc are mainly PC-based.

Even with the high total of volumes the average stock per library is so relative small that for many years there was little interest in library automation. In later years the interest has arrived, first with the wish to use BASIS and Artikelbasen for information retrieval, later with the wish to have local systems.

Compared with academic libraries circulation represents a much larger percentage of the work load in the public library (see sections). But there is also much demand for efficiency in the computerized systems. Many circulation systems on the world market will not be able to live up to the speed and performance needed in the Danish public libraries.

A special issue is some simplified system used in school

libraries and some public libraries. The retrieval capabilities are so limited, that these libraries actually depend on use of BASIS for all serious retrieval. On the other hand the 11 public libraries in the Roskilde group have introduced a menu driven interface to the OPAC.

The work in the school libraries is very independent and not interrelated even with other schools in the same local authority apart from some technical cooperation in book selection and acquisition routines. The obvious thing to do has, therefore, been to choose stand alone systems.

The number of schools with library automation is estimated at 300 at the beginning of 1991. A continued growth rate is expected.

One of the factors that stimulates the introduction of library automation in the school libraries is the new act of public lending rights. This act will pave the way for reporting of stock information for public lending rights purpose.

The present situation with one system for one school will gradually change to multi-user systems with an OPAC facility. These systems will also gradually become interlinked in each local authority. There are also some indications right now of a definite wish to integrate public libraries and school libraries into the same system and network. The first example will be in operation by the end of this year.

5.3 Systems and system modules implemented in Danish libraries

Legend to the following 4 tables.

Type of library:

LA Large academic library
SA Small academic library
UIL University institute library
PL Public library
SL School library
OIL Other library institution: Kommunedata, Bibliotekscentralen, The Depository Library and the Central Immigrant Library

Type of modules:
I/O MARC: Marc import/export
Cat/retr: Cataloging and retrieval
Circ: Circulation control
Acq: Acquisitions module
Ser: Serials administration
Rep: Report generator

<+> implemented <t> modules in testing (All systems with <t> in acquisition have simplified versions). 1) only MARC in, not out. 2) simplified form. 3) in co-system

A list of Systems and system modules implemented in Danish libraries is given below.

Table 5.4

Library Suppliers with systems of more than 40 terminals

	Academic libraries	Public libraries	Total
Dataconcept	1	-	1
DDE	1	2	3
Kommunedata		1	1
RCI	6	1	7

Systems implemented in Danish libraries according to type of library and suppliers

Table 5.5

Type of library	LA	SA	UIL	PL	SL	OLI
Number of libraries	20	159	278	250	275(1800)	3
Aleph (Dataconcept)	1	1	+			
BIBDIA (Norsk Data)				3		
Bibliomatik (Dantek)				5	+	
BIBS (Scanvest)				2	+	
BRS (Datacentralen, BRS)	1	7				
DCTS/DCBS (DC Informatik)	6	4	+			
Micromarc/microlib (RCI, Norsk Systemutv.)		9	+			
Mikromaster (KMD)		15			+	
PCInfo (Datacentralen)		10	+			
RCLib (RCI)	8	18	+	1		2
Supermax (DDE)	3	1	+	11		
TINlib (IME, Unisys et al.)	1	2				1
UNIMASTER (KMD)				+		
Undecided at time of reporting	1	+	+	23	+	

Table 5.6	S Y S T E M M O D U L E S No of libraries, not no. of installations					
Type of modules/ system	I/O Marc	Cat/ Retr	Circ	Acq	Ser	Rep
Aleph Dataconcept	LA + SA + UIL +	LA 1 SA 1 UIL +	LA 1 SA 1 UIL	LA 1 SA 1 UIL	LA 1 SA UIL	+ +
Bibdia Norsk Data	PL +	PL 3	PL 3	PL 3	PL 3	+
Bibliomatik Dantek		PL 5 SL 300+	PL SL 300+			+ +
BIBS Scanvest	PL (+)	PL 2	PL 2			+
BRS	LA + SA +	LA 1 SA 7				
DCTS/DCBC DC Informatik	+			LA 2	LA 6 SA 4 UIL +	+ + +
Micromarc/Microlib Norsk Systemut- vikling/RCI	LA + SA +	LA 1 SA 8 UIL +				+
Mikromaster Kommunedata	SA + SL +	SA 15 SL 20+	SL 20+			+ +
PC Info Datacentralen	SA UIL	SA 10 UIL +	SA 2			+
RC Lib RCI	LA + SA + UIL + PL + OLI +	LA 8 SA 17 UIL + PL 1 OLI 2	LA 4 PL 1	LA t	LA t	+ + + + +
Supermax DDE	LA + SA + UIL + PL +	LA 3 SA 1 UIL + PL 11	LA 3 SA 1 UIL + PL 11	LA t SA t PL t	LA t SA t PL t	+ + + +
TINlib IME/RCI/Unisys/ Mentor	LA + SA + OLI +	LA 1 SA 2 OLI 1	LA 1 SA 2	 OLI 1	 OLI 1	+ + +
Unimaster Kommunedata	PL +	PL 30	PL 30	PL t	PL t	+

Modules available in the systems in operation in Danish libraries

Table 5.7

	M O D U L E S					
S Y S T E M S	I/O Marc	Cat/ retr	Circ	Acq	Ser	Rep
Aleph Data Concept	+	+	+	+	+	+
BIBDIA Norsk Data	+	+	+	+	+	+
BIBLIOMATIK Dantek	-	+	+	+	+	+
BIBS Scanvest	+ 1)	+	+	+	+	+
BRS BRS/Datacentralen	+	+				+
CDS/ISIS Unesco						
DCTS/DCBS DC Informatik	+	+	+	+		+
MicroMARC/Microlib Norsk Systemudvikling	+	+	+			+
Micromaster Kommunedata	+	+	+	+ 2)	+ 3)	+
PC Info Datacentralen		+	+			+
RC Lib RCI	+	+	+	t	t	+
Supermax DDE	+	+	+	t	t	+
Tinlib IME/Unisys/Mentor	+	+	+	+	+	+
UNIMASTER Kommunedata	+	+	+	t	t	+

5.4 In-house development of systems or parts thereof

An outstanding example is Risø Library, which has developed its own local system. This is the only system in Denmark, which might rigthly be called an in-house system, developed by the library itself in cooperation with BRS, but using in addition DCTS in cooperation with DC Informatik A/S.

Moreover acquisition lists as well as other publications are produced from the system. This library is responsible for the DANDOK database as well, and furthermore produces indexing and input to some international databases.

RISØ Library has the advantage of RISØ Research Center (affiliated to the Ministry of Energy) taking care of the network as well as dedicating a microVAX computer to the library.

Another example of close cooperation on automation between the library and its "mother institution" is Folketingets Bibliotek og Oplysningstjeneste (The Library and Information Service of the Danish Parliament), which is one of the users of the MINIBIB system.

The internal network implemented in Parliament gives the MPs access to the internal information system of Parliament as well as to the library catalogue MINIBIB, which is using the RC 8000 computer in The Administrative Library. But being an internal network, it does not give the MP's access to databases or holdings of libraries other than those represented in the MINIBIB.

The Royal Library has developed an input system, called REXCat, independent of the equipment of the main supplier, RCI, and a report generator, REXRap, to be used with the RC library system, but able to be used with IBM compatible terminals as well.

5.5 ILL system (Mail box)

After an extended test period the so called mail box, which is an ILL facility, was introduced by FEK in 1990.

The Danish libraries have for many years been using a standardized form for ILL loan requisitions, called Standard 58. FEK has developed the mailbox facility in such a way that records found in ALBA with location data for one of the libraries offering this ILL facility may be requested by an online procedure. The libraries receiving the requisitions have to empty their mail box regularly. Then they have the advantage of receiving requisitions correctly printed out on the Standard 58 form according to the record found in ALBA.

At the end of 1990, the 13 libraries which accept ILL through the ALBA mail box were receiving requests from about 90 other libraries (academic, public and private libraries). During the latter part of 1990 the ILL increased to more than 4000 requests pr month, about 13 per cent of the total amount of requests normally received by those libraries.

The ILL function of the central system is not at present integrated with the local circulation systems (where such exist), which means, that the receiving library has to input the loan requests coming via ALBA users into its own system. The libraries with local circulation systems would, therefore, prefer the ALBA users to access the local database system directly and place the order there. To facilitate the process automated transfer of loan requests from libraries via ALBA to local circulation systems is expected to be developed by ALBA in the near future.

5.5.1 Charges for loans

ILL requisitions via ALBA are free of charge. The user library has to pay the telecommunication costs as is customary. These costs will, of course, be slightly higher, when more connect time is being used because ILL requests are made in ALBA.

5.6 Change of system

The first of the academic libraries to establish an automated system was the National Technological Library (DTB, Danmarks Tekniske Bibliotek). This library has since then chosen to change its system (the new supplier: The Danish company DataConcept A/S, a representative of Ex Libris, Ltd., Tel Aviv) and thus had to change its circulation system, too. Consequently for a period in 1990 DTB had to rely on FEK for the circulation to the external users.

Roskilde University Library (founded in 1971) did not until a few years ago have an integrated system, but several of its household functions, cataloguing, catalogue production, list of books on order, and circulation were automated, though not in an integrated way. The library has made a change of system as a contract was signed in 1988 with DDE for an integrated Supermax system to be developed. Acquisition and serials control are not yet fully developed, but a circulation module is part of the system.

Most recently The Library of the Aarhus Business School, which at present has a satellite system based on RCI equipment in the local SOL-system of Statsbiblioteket, is negotiating a system of its own.

It is to be expected that some more libraries will be changing system over the coming years, as their databases grow and their demands become more specified.

Commentary

In the Danish library market the main suppliers are 13 companies among which many of Danish origin. Only in one library the development has been mainly in-house, in cooperation with a software supplier.

The introduction of circulation systems in the Danish libraries has been a lengthy process, which might be partly due to the difficulties of retroconversion of the catalogues of the academic libraries. This again may be due to the lack of standardization in the existing card catalogues. The catalogue cards of the academic libraries are lacking identification numbers which might well have led to easier capture of machine readable records from foreign catalogues or national bibliographic sources.

Changes of system has been seen in several cases. The trend is to prefer UNIX based systems which indicates the wish for standardized and portable systems.

Serials control and acquisition systems are on their way, but not yet fully integrated into the library systems. Management information systems are not really seen.

6.0 IT-BASED USER SERVICES

A number of IT based user services have been introduced during the period, and well known services like bibliography or business information have been seen on new media. In many libraries in addition to the traditional media new ones have been offered to the users as just another kind of publication form. Thus also computer software is being offered on loan to the users in some public libraries.

6.1 The OPACs

The OPACs, which were rather scarce in Denmark in 1986 are now far more widespread and are popular with the users here as everywhere else.

Besides offering the catalogue information on books and periodicals in the local OPAC, some university or special libraries have input further information in the system as a service to the users. For instance some special libraries have started indexing some of the important periodicals of the subject area most relevant to their students as input to the local systems.

The database of Danish periodicals articles, Artikelbasen is offered by Statsbiblioteket (The State and University Library) and The Royal Library as a separate OPAC to the users for online retrieval without charge, but not integrated in the library systems, SOL and REX. As legal deposit libraries these two libraries make Danish materials available on loan, thus the records in Artikelbasen will cover material to be found in these libraries.

6.1.1 IANI

In 1988 a project supported by NORDINFO was completed, in cooperation between the company CRI, the Norwegian BRODD, and some Nordic databases, resulting in a software product, which is now available on the market as a library facility. IANI means Intelligent Access to Nordic Information systems. It is an interface to different databases making retrieval possible with the same retrieval language (CCL) to library catalogues with different retrieval languages (see 32 a-b).

6.2 CD-ROMs

In 1988 the first CD-ROMs were acquired by the academic libraries. In several university or special libraries they are offered for use in the reading room (free of charge). Two of the libraries (The Royal Library and The National Technological Library) have connected their CD-ROM stations to the local network thereby making it accessible from various working places in the library. Judging by the experience of The National Technological Library, the possibility of free

access to CD-ROMs has so far not had much effect on the demand for retrieval in external databases (which is a paid service). This may be due to the fact that many more databases are accessible online than by CD-ROM.

Some libraries have been discussing the possibility of sharing the acquisition of CD-ROMs, but no agreements of this kind have been reached so far. Some libraries have considered abandoning the subscriptions to periodicals when these were published on CD-ROM, but not all have taken this step.

A public library had a state grant for experimental use of CD-ROM (see 37) which is at present used in about 25 public libraries.

6.3 Access to the local databases of other libraries

The libraries connected to the DENet may offer the users open access to the catalogues of the other libraries in the network. This has up to now been done only infrequently.

In some of the academic libraries the users are offered access to ALBA through the network, even though, as mentioned above, ALBA originally was designed as a database to be used by library staff only.

6.4 Library introduction using hypercard

The Library of the Aarhus Business School introduced a few years ago a PC based introduction to the library using hypercard. This system has been developed for the library by an institute of the mother institution.

6.5 Business information

Business information has been available for many years in the academic libraries, and may be considered a normal part of the service in those libraries which have the appropriate kind of literature in their collections. The development is probably due to greatly improved accessibility to a considerable number of databases with business and market information.

The question of payment is a point of debate. While academic libraries usually tend to regard this as a service to be paid for by the users, public libraries are controlled by a library act that stresses the free use of libraries. However, a change in that act in 1989 made it possible also for public libraries to recover costs from the users in connection with spezialised information retrieval. 26 public libraries are reporting that they are offering business information service. Of these 8 libraries are offering the service free of charge, while 18 have introduced it as a paid service.

6.6 DTB*Teknet

A new service has been offered lately by The National Technological Library: DTB*Teknet, which makes it possible to have a subject area regularly monitored by the library using every possible IT facility available. The service offers consultancy to companies as well as information management and library management.

6.7 Telefax service

At least 71 of the 179 academic libraries and 115 of the 249 public libraries have introduced telefax during the last few years as may be seen from the telefax numbers found in the Library Directory 1990. But the number is growing rapidly, as telefax is a great help in the daily communication.

For the library users Statsbiblioteket has introduced a special service, so that loans may be requested from anywhere, so to speak, - a university institute, a hospital department or a private company office - and delivery (usually of periodical articles) takes place within an hour by telefax. The price is 1 DKK pr page delivered; surprisingly enough this service has not been used a great deal, whether due to the cost or for some other reason. Apart from this telefax is not offered for public use by any library.

6.8 Public libraries' R&D projects

Due to the offer of a state grant of DKK 3.5 millions annually for R&D work in public libraries and school libraries about 20 projects, larger and smaller, are carried out each year. Every year there are some projects with a high element of IT. Some examples should be mentioned:

6.8.1 HELOS project

HELOS was a very ambitious project carried out in 4 library systems (Herning, Egvad, Lemvig og Struer). The concept was to install Unix based equipment in all 4 libraries and to explore the possibilities of interconnection and connection to remote systems and the creation of services depending on local databases.

Apart from the technical exploration databases were created in 4 areas: Community information, Music information, Childrens information and Business information. Data were exchanged between the libraries.

Some parts were not integrated in the UNIX concept, e.g. workshops for children's computer literacy, but were integrated in the overall project concept.

The test period was 1986-88. The project must be considered innovative as little experience existed at the time of

implementing UNIX equipment and building databases in such relatively small libraries.

The project is well documented in its own reports and in a report by a separate evaluation team (43 a-c). The project also marked the introduction of DDE local library systems. The overall costs were close to DKK 10 millions.

6.8.2 Business information

A number of other projects on business information has been supported, for example the Samsø project (42). Samsø is an island with 5000 inhabitants. The library project was part of an overall scheme for industrial development in that community.

Another project was carried out at Brande public library serving 10.000 inhabitants. After the project the service was offered permanently and about 50 small and medium sized companies are served by the library.

An offspring of HELOS was seen in Struer, the home town of Bang & Olufsen, known as manufacturer of sound and video equipment. This company buys block services in business information from the public library on a regular basis.

6.8.3 Children's computer literacy

As a part of HELOS the four participating libraries had computer workshops for children. This has also been a new activity in about 20 libraries. During the home computer boom this was done as an alternative to arcade games with assisting instructors. Now instructors are not that frequent anymore, but the computer workshops are still popular with a range of games, educational programs and general PC programs.

6.8.4 Computer library

The city of Copenhagen runs a centre for computer literacy training and education especially for young persons and unemployed people (see 39). The public library has established a branch library with collections of computer literature, but more important of software, too. Part of this may only be used in-house for copyright reasons. Other parts are for circulation.

The City of Aarhus has had support for a similar project.

6.8.5 Music workshop

Odense public library has had support for a computer based workshop for music. It is not a recording studio, though it may be used as such, but a workshop for composers and editors of all types of music with computers linked to digital music instruments with the sufficient assisting software.

6.8.6 Bookhouse

Developed at The Royal School for Librarianship and later at the research institute Risø an experimental type of OPAC has emerged. It is called the Bookhouse. It represents a new way of indexing mainly fiction and the indexing is presented on cartoon type image screens. Searching is by a mouse selecting icons.

The system is well described in the literature (35 a-e). With public library R&D money the Bookhouse has been in use with great succes in a Copenhagen suburban library.

6.8.7 Library terminal

Herning - part of HELOS - has started an unsupported development of specialized terminals for library use in cooperation with their general supplier, DDE and another Danish company CODECO.

Various types are found:

* Mobile library terminals: Search and retrieval (OPAC) in the central computer and circulation control with radio link communication. This is now used in mobile branches of several library systems.

* A circulation control terminal with very high efficiency.

* A specially designed OPAC terminal with simplified keyboard and some of the ISO 8777 commands as function keys.

* A terminal for dialogs between user and librarian with double screen, one facing the user the other one facing the librarian. The librarian may make a search and display it to the user and continue with e.g. extended searches. (This project is still in the development phase and has got support with a state grant).

6.9 Training for the use of IT

Both the courses offered by the section for consultancy of the Royal School for Librarianship, by FEK (in its Demo-Room, where several retrieval systems can be experienced), and by the suppliers of library systems or UNI*C, as well as by Dansk Diane Center, may be seen as an offer to the end users as well. None of these courses are free of charge.

The individual libraries, however, offer courses in information retrieval and uses of the OPAC - from one or two hours to half a day - to their users, very often as part of the freshmens introduction to the library.

Commentary

The introduction of IT in libraries has brought about a variety of new user services, and many more are sure to follow as the libraries grow increasingly familiar with all the possibilities of an automated library. Need as well as new ideas very often manifest themselves during the daily use of the automated library systems. Therefore the development may well most successfully be brought about through cooperation between libraries and IT suppliers.

A scheme of special state grants as is seen in the Danish public libraries seems to encourage innovative projects.

7.0 STANDARDS

In addition to the information on use of standards in the Danish library system, it may be generally said, that the Danish library community is well aware of the importance of standardization and it is the intention to use standards to the greatest possible extent, such as the ISO and DS standards for character sets and transliteration, ISBN, ISSN, communication format ISO 2709 (the Danish equivalent is DS 2162). The bibliographic format is danMARC, closely resembling UKMARC (see 19). So far no Danish library uses Unimarc.

But in at least one area standardization is not felt to have been altogether successful: transliteration, which is a cause for concern, when reuse is the issue. International standards for transliteration have existed for many years, but do not seem to be observed by the library world. This means that name forms received with records from tape producers cannot be reused but have to be reviewed, and possibly corrected, to fit into the name forms used in Danish libraries.

7.1 Bibliographic standards

Many Danish libraries have, however, maintained the view, that cataloguing according to AACR2 rules is too closely connected to the production of card catalogues and has moreover been unnecessarily complicated considering all the capabilities of an online catalogue, and finally far too time consuming as well.

As a consequence of this criticism of the rules for cataloguing, a working party was set up by the National Library Authority to establish principles for cataloguing to the online catalogue. A report was issued in 1990 called FORMKAT (20). The intention was to set down principles for those libraries which wanted simplified cataloguing rules, while at the same time stressing that any data elements other than those treated in the report must follow the Danish Cataloguing Rules, which of course also applies to all national bibliographic work.

7.2 Classification

There is no common standard for classification in the Danish academic libraries. DK5, which may be regarded as a Danish variant of DDC, is used by the public libraries and some academic libraries. One academic library uses DDC, while a group of larger academic libraries are using UDC. But very many classification systems are produced and maintained by the library itself.

7.3 Retrieval language

The retrieval systems of the library catalogues are mainly based on the international standard ISO 8777 (or its Danish

equivalent DS 2347), some of them on an earlier version of the CCL, though. Public libraries follow the same pattern. Most local library catalogues have retrieval facilities up to full ISO 8777 level. 10-12 of the academic libraries, mostly technical, and among them Risø, are using BRS, which is not CCL, 2-3 are introducing the hypertext based retrieval system of TINlib.

7.4 UNIX/POSIX

At the machine level there is a wish for portable systems and standardized operating systems, UNIX/POSIX being the standard expected to become dominating in a few years time. So the intention is to use UNIX based systems in the central systems as well as in the local library systems. As it would be very expensive to change all systems and equipment in the libraries, there will have to be a transition period, during which the designers of the central systems will have to accomodate users with the existing equipment, while any new equipment acquired at the local level has to observe the standards.

8.0 COMPANY OVERVIEW

As can be seen from section 5, just a few companies have supplied the library systems operating in the larger libraries, and some more companies have supplied system modules or software packages for library use.

8.1 Suppliers of systems, or parts thereof

The three main suppliers on the Danish academic library market are RCI, DDE and DataConcept, which are also the only ones with installations of more than about 40 terminals/workstations.

In public libraries RCI has only one installation and DataConcept none at the end of 1990. Here the main suppliers are Kommunedata and DDE. RCI is, however, also supplier of KMDs UNIMASTER. KMD is a major supplier to the school libraries along with Dantek.

It is an interesting fact that most of the suppliers on the Danish market are of Danish origin, and that some suppliers with many installations in the neighbouring countries are not at all represented in Denmark. This may partly be due to the demand in Danish libraries for individual solutions and the rather great variety particularly among the academic libraries.

8.1.1 Software packages for local use

Many of those libraries, which have not implemented local systems, but have joined ALBA/SAMKAT, have up till now either contended themselves with using this system as a supplement to their card catalogues, or have acquired some database software for a local retrieval system.

Several such software packages are in use in each case in a small number of (mainly small) libraries.

Such packages are:
Open Access,
AskSAM,
Bibelation,
CDS/ISIS (from Unesco, free of charge, distr. by The Royal School of Librarianship)
Microfind (from the company Z A G /Alex Gorski)
Micropolydoc (Norwegian, particularly for libraries of industrial companies, in Denmark marketed by a small company, Nordic Info Center)
The in-house experimental system MicroBes of The Royal School for Librarianship is also used by a few libraries for cataloguing and retrieval.

8.2 The supplier companies

Data on the individual suppliers are given below:

8.2.1 DataConcept

The company: The small company DataConcept has only been on the Danish library market for a year or so. It has been a Digital OEM supplier for many years, but now has the responsibility for marketing and support to the Aleph system, originally supplied by the company Ex Libris Ltd (Tel Aviv).

An annual turnover of DKK 28 millions is reported, and 5-7 persons are working in the library section.

Products: The product offered by this company is an integrated library system, ALEPH, designed in Israel intended for a VAX environment (Digital Eqp. Corp.). Originally it was supplied for VAX computers with the operating system VMS, but now a UNIX-version is being developed, expected in 1991. The original Aleph system is seen in several installations in foreign countries.

Implementation: The National Technological Library was the first to acquire this system, and the installation is rather large (103 terminals/workstations); since then it has been acquired by 2 other, smaller libraries, and 2 or 3 more libraries seem to be on their way to choosing this system.

Modules: Cataloguing and retrieval functions, import/export
OPAC with CCL
Thesaurus
Circulation system,
Acquisition with accounting system,
Serials system,
PC based Navigator acoounting system
Report generator

Prices: The company has not reported anything about its prices, but for instance an installation with about 40 terminals/workstations is expected to become operational in a higher education library for about DKK 2 million.

8.2.2 Norsk Data

The Company: Norsk Data is a large general supplier of hardware and software of Norwegian origin. The company has a firm position in Denmark in the area of mini-computers and related operations.

The product: The library system BIBDIA is developed in Norway, Sweden and Germany from experience gained on earlier systems. The version offered in Denmark is customized to Danish specifications. The first Danish installation used the proprietary operating system Sintran, but all new installations will be UNIX. Norsk Data has got an experience comparable to Kommunedata' of combinations of library and town hall computing.

Implementation: The first delivery took place in Nordborg public library in 1989. The library has its own computer as a twin to the town hall computer. There are other installations in operation and some confirmed sales.

Modules: The system comes in modules in the traditional way for local systems. Its system is the only local system on the Danish market that can control library economic management integrated with the general systems public sector economic management.
The acquisition module has been chosen for a stand alone acquisition system in Copenhagen Municipal Library.

Prices: No prices have been reported.

8.2.3 **Dantek**

The Company: Dantek is a very small, new Danish company founded by school librarians and teachers to provide school libraries with modestly priced stand alone systems. There is a staff of 5.

Products: PC based integrated systems for school library use.

PC network based integrated systems for smaller public libraries

A UNIX based system is in progress.

Implementation: The first deliveries took place in 1988, since then systems have been installed in more than 250 school libraries

Modules: The systems are PC based and consist of modules including a school library management system incorporating circulation control (Bibliomatik), an OPAC module (Dankatalog) and modules for integration of several schools (Dankatalog Plus).

Prices: The basic package is priced at DKK 10.000

8.2.4 Scanvest

The Company: Scanvest is a company represented in several of the Nordic countries. It is owned by Olivetti. Scanvest is a supplier of hardware and software for many purposes. Libraries are but one of the many marketplaces covered.

Products: Scanvest offers as a distributor the local library system BIBS. It is a portable UNIX system with good qualities in household procedures. It is often seen on INTEL and OLIVETTI hardware.

Implementation: The first Danish installation came in Slagelse County Library in 1989/90. Some others have taken place and some are confirmed sales.

Modules: BIBS holds all typical modules for a local system. It is strong in circulation and administrative routines.
It has a more modest type of OPAC, which is not working with CCL.
It can import MARC records but can't store or export them.

Prices: A price of DKK 144.400 has been quoted for a software package to a small library.

8.2.5 BRS Scandinavia

The company: BRS Software Products Scandinavia is a small company, which in Denmark employs 3-4 persons working in the field of library automation.

Products: The company offers software from a foreign company, a division of Maxwell Online, Inc. This software was originally offered by Datacentralen af 1959. BRS/Search, which has been acquired by several libraries is offered at various prices according to the size of the computer - from a PC to the Supermax of DDE, i.e. single user or multiuser versions.

Implementation: BRS has been the basis for the development of the integrated in-house system at RISØ Library (together with DCTS of DC Informatik). The retrieval system is considered very user friendly.

Modules: BRS/Search is a database software for advanced retrieval, but it is not based on CCL and does not work in accordance with ISO 8777.
Well-suited for CD-ROMs.
There is a thesaurus function as well, and report generator.

Prices: A licence for BRS (search with MS-DOS) cost DKK 17.000, while BRS/search for the UNIX computer Supermax will cost DKK 167.300, and DEMON an additional DKK 33.426, thesaurus also DKK 33.426.

8.2.6 DC Informatik A/S

The company: This company was originally called Norsk Data Consult A/S and was therefore often confused with Norsk Data A/S (see below, 8.2.2), which has been on the Danish library market for some time. The company has recently changed its name to DC Informatik A/S, but has now been acquired by Norsk Data A/S. It is a small company, with 3 people working in the library market, and 60% of its turnover coming from that market.

Products: The company is offering DCTS, which is used by many academic libraries for serials control.

Originally aiming at public and private libraries, this product has been developed - in cooperation with RISØ Library - to be used for serials control in academic libraries as well. It has been adjusted to be used with the RCLib systems as well (DCTS+).

Another product is DCBS, which is being used by one library for its book catalogue (for holdings registration, card and list production).

The products DCTS and DCBS are able to operate with various kinds of operating systems, development work is in a UNIX environment.

Moreover this company is now the Danish representative of Norsk Systemutvikling (see below), offering Micromarc for cataloguing and retrieval.

Modules: DCTS is for serials administration, and has been used in the libraries for circulation of periodicals to readers in reading circles as well. Searching the serials titles and producing lists of serials is also possible. Circulation is working in 1-2 libraries. DCBS is intended particularly for book circulation.

Implementation: Several libraries use DCTS for serials, one library The Royal Military Library (KGB, Det Kongelige Garnisonsbibliotek) is using it for both books and serials administration.

Prices: No prices have been reported.

8.2.7 Norsk Systemutvikling A/S

The company: This company is situated in Oslo, Norway, and has no office in Denmark. The product offered on the Danish market for about 5 years by at least two Danish companies, Micromarc, has been acquired by some of the clients directly from the company in Norway.

Product: Micromarc has been acquired by some middle sized academic libraries as well as many university institute libraries for cataloguing and retrieval for PC use. The RC version was marketed under the name Microlib (for CCPM or DOS).

Modules: Cataloguing, the modules allow reuse of data from ALBA/SAMKAT,
retrieval, with a retrieval system based on CCL,
list and
card production.

Implementation: Particularly in many of the university institutes of the Copenhagen University, where the institute service of The Royal Library is cataloguing the books of the institutes on site, a large number of MicroLib/Micromarc has been installed. But many small or middle-sized libraries have acquired it as well.

8.2.8 **Kommunedata**

The Company: Kommunedata is a common data processing provider for the local authorities, a publicly owned commercial operator with 5 branches in the different regions of Denmark. It has 1800 employees and a turnover of DKK 1.200 million. 40 staff members are allocated to library operations.

Products: The library oriented products may be dived into:

Local systems:

* Development, sales and support for local library systems.

At the PC level Kommunedata supplies the MICROMASTER system, which is a self contained integrated library system with a number of facilities e.g. to download from BASIS.

A number of versions of older local systems all UNIX or XENIX based are now to be superseded by the system UNIMASTER launched in 1990. This system is the only portable UNIX system on the Danish market apart from BIBS. UNIMASTER is used on platforms such as RC 970, RC 990, RC9000, IBM RS6000, COMPAC, NOKIA and others.

The software is divided into modules and comes in different licence forms ranging from 4-user versions to versions with more than 100 users.

Other library activities:

* Running the outdated transaction card system for photocharging

That photocharging is still in relatively intensive use is a fact that should not be counted against the public libraries, it will hopefully disappear within a few years.

* Software supplier and service bureau for parts of Bibliotekscentralens operations.

Bibliotekscentralen is at present doing most of its cataloging into a Kommunedata system on an IBM mainframe. That system has also produced a number of printed bibliographic products - that part has been transferred to an in-house system at Bibliotekscentralen. The system - initiated in 1976 as one of the first major online cataloguing systems (internationally speaking) will be phased out with the introduction of DANBIB.

* Host service for BASIS used through more than 1000 passwords.

The host service is provided at 2 RC 8000 and 1 RC 9000 (emulating RC 8000). The system is a greatly modified version of the original RC-Lib library system. The host system is situated in the Aalborg department. (See also BASIS).

Implementation: After some tests the first local system was installed in Bjerringbro public library in 1986. This was a circulation system including some other administrative routines. It has no significant name, but is simply referred to as KMD 'udlånssystem version 1 or 2'. Since then a number of local systems (28 approx) of this type have been installed, with a higher and higher degree of integration with BASIS as an OPAC and as a holdings database in correspondence with the local system.

From 1990 The UNIMASTER system is launched and will supersede all previous UNIX systems from KMD.

Some smaller public libraries, some school libraries, special libraries and academic libraries have also installed the single user DOS based MICROMASTER.

Modules: Unimaster covers all typical modules as acquisition, cataloguing, OPAC and circulation. Special features are the integration with the host BASIS for connection, upload and download.

Prices: The UNIMASTER software package is divided in modules and priced according to size of installation. The smallest complete package is priced at DKK 167.000.

8.2.9 Datacentralen af 1959 I/S

The company: Datacentralen af 1959 (DC for short) is an old Danish company partly owned by the Danish State, but now expected to change to be part of TeleDanmark. The company was involved in the very first Danish library automation projects with The National Technological Library and Roskilde University Library as well as being responsible for the care and maintenance of documentation. It has a total staff of 1400 and an annual turnover of about DKK 1000 million. About 100 staff members are working with information systems, but only 3 of these are working specifically with library sector products.

Products: PC-INFO is the best known of the products developed for libraries; as the name says, it is intended for PCs.

Datacentralen is also marketing BRS/Search in Denmark, PC as well as UNIX based, but this product may be supplied from the small company BRS Software Products Scandinavia as well (see BRS).

Implementation: PC-INFO was developed for the libraries of The Technical Colleges, which cooperate closely with the National Technological Library, but it is also being used by the Library of The Directorate for Patents. A large group of university institute libraries in The Technological University are using PC-INFO.

Modules: PC-INFO is used for cataloguing and retrieval. In one library a circulation module has been implemented as well.
It does not import records from ALBA/SAMKAT, nor export records to that system.

The next version of PC-INFO is now in its final test phase and announced due for 1991. It has phonetic search as one of the facilities of the retrieval system.

Prices: No information of prices has been given.

8.2.10 RCI

The Company: RC International, RCI, formerly Regnecentralen af 1979 A/S, was originally one of the oldest Danish companies on the IT market, but has since been reorganized and changed ownership a few times.

Today it has about 600 employees, of whom 15 are reported to work in the library market. The company has an annual turnover of DKK 500 million.

Products: RCI has for many years been manufacturing RC 8000, a very reliable minicomputer, for which the library system RCLib was developed. This system was offered as early as 1980.

In 1989 a new computer, RC 9000 was announced to be due on the market late in 1990 with a UNIX based system, RCLib2. This system has been delayed, though. In the meantime the RC 9000C (or RC 9000-10) is emulating RC 8000 for some of the libraries.

Some smaller, UNIX based computers, RC 970, RC 990 are offered, as well as several kinds of terminals and work stations, and local area networks as well as ethernet.

For a period of time RCI was the vendor of Microlib, which is the RC version of Micromarc, a software for cataloguing and retrieval from Norsk Systemutvikling, Oslo. It proved to be successful with the RC terminals, but less so with IBM compatible PCs. The cooperation between Norsk Systemutvikling and RCI has now been discontinued.

In addition RC is marketing the UNIX based multi-user library system UNIMASTER, made by Kommunedata. UNIMASTER may operate on various kinds of RCs: 9000, 970, 990; it is so far only seen in public libraries.

Implementation: In the middle of the eighties several Danish local library systems were implemented based on RC 8000 equipment. This is now operating in 8 of the 20 largest academic libraries. The Odense group of RC library system users consists of academic libraries except for one middle sized public library (a county library). 6 of these installations have 40 or more terminals or workstations. Most of these libraries have acquired RC 9000 computers and intend to use the UNIX system, when it is ready.

Det Administrative Bibliotek has stuck to the old RC 8000. This system is now serving 18 small or middle sized academic libraries.

Statens Bibliotekstjeneste

BC and KMD are using RC computers (see those)

UNIMASTER: see KMD

Modules: Cataloguing and retrieval were the first functions in operation on the RC computers, with import/export modules,
the online catalogue using CCL,
circulation systems are in operation in several of the installations, and
acquisitions and serials control have recently been offered as well, but have so far hardly been put into operation in any library.

The development is aiming at a fully integrated, UNIX based system.

A report generator has made it possible to have orders and claims printed out for acquisition functions, and statistics may be obtained from the system as well.

Most of the RCLib systems may be called by dial-up, X25 or X28.
The RC local library systems are connected to the DENet, except that of Det Administrative Bibliotek.
E-mail is a facility offered by RCLib.
MicroLib (Micromarc, see Norsk Systemutvikling) is merely a PC software package for cataloguing and search.

Prices: Prices for the RC 900-series range from DKK 12.000 up to 300.000, the RC 9000 computers are offered at DKK 490.000 -3 million.
The basic RCLib system module costs DKK 150.000-350.000.

8.2.11 **DDE**

The company: DDE has only been on the library market for a few years, but has in a short time sold and implemented a number of well functioning systems in Danish libraries.

It is a Danish company with a total staff of 500, and 15 of these are working primarily for the libraries.

Products: DDE is offering a UNIX solution on its series of Supermax computers. The Supermax is a recently constructed 8-bit machine (1988/9), able to communicate by many different protocols. The system is designed for 4 to 256 users, and the software and the computer have to be acquired together.

The Supermax system has no specific name. It may be called by dial-up or by X25 or X28. Supermax local database systems are connected to the DENet.

Implementation: DDE is able to claim to be the only one of the main suppliers to have several successful installations both in academic libraries (3-4 systems) and public libraries(11), these libraries making up the Roskilde group. Several of these have 40 or more terminals/workstations. Some more installations are under way.

Modules: The modules of the system offered are fully integrated.
Cataloguing (with authority control system) and import/export modules,
retrieval functions, with OPACs using ISO 8777 as standard for the retrieval system. Further facilities of the retrieval system are being developed.
The circulation function is remarkable in that it works well both in an academic and in a public library environment, though clearly these have different parameters in the set up.
Acquisitions and serials system in one module with accounting is in a test phase.
Integration of report, statistics and word processing functions seems to be working well.

The DDE group of libraries are connected to the DENet.

Comments: DDE library (Herning) has found a special solution to the problem of automating the circulation system in the mobile units (book busses). Further experiments in cooperation with CODECO, a small Danish company, concerning construction of special

user friendly terminals are being carried out.

Prices: DDE has been very flexible and offered individual solutions to the individual client libraries. Therefore price comparisons are not very easy to make.
The company reports that the prices range from DKK 200.000 and upwards.

8.2.12 **Unisys/ Mentor/ IME**

The companies: Unisys has supplied the computer 2200/444 (OS 1100) on which ALBA/SAMKAT is running at UNI*C.
It has also as a representative of IME been the supplier of the TINlib system used by a few libraries. In the Danish branch of this company, 2 persons have been designed to concentrate on the library market.
IME, London is the originator of TINlib which has been marketed in Denmark by various companies.
The Danish company Mentor is able to offer TinLib in a Danish version as well. Mentor does not want to disclose to which libraries they have sold library systems (or modules).

Products: TINlib presents itself as an integrated library system, offered in a single user version as well as in a multiuser version, with DOS, PC-network or UNIX.

Implementation: TINlib is now being implemented in the Library of The Royal School for Librarianship, one of the 20 largest libraries, and in a few small or middle-sized libraries. The Depository library has acquired a UNIX version.

Modules: All modules of an integrated system are offered in Danish, but only a few are implemented in Danish academic libraries.
Particularly to be mentioned is an advanced retrieval system operating on hypertext principles.

Price: A PC version of the library system cost DKK 115.700, while a UNIX version is offered for DKK 230.000.
The prices mentioned by Mentor are a little higher than those mentioned by Unisys.

8.3 Special companies and institutions

8.3.1 Bibliotekscentralen

The Company: Bibliotekscentralen is a foundation that owns a number of companies to form the Bibliotekscentralen group. In this report Bibliotekscentralen A/S (ltd), BC, is the important part. Here is a staff of 160.

Other companies in the group produce and sell library furniture and equipment. The production is in Denmark and Mexico. There is a distribution network in Europe, America and the far East.

Bibliotekscentralen started life in 1939 as a producer of printed catalogue cards and other bibliographic products primarily for the public libraries. However, it also produced the manuscript for the monograph part of the national bibliography..

Products: Today the activities at Bibliotekscentralen can be divided into:

* Producing parts of the national bibliography

* Making the value added versions of bibliographic records enhanced for public libraries and school libraries.

* Acting as host centre for Artikelbasen (reference to articles in journals) with 300.000 references used by 200 user institutions.

* Supplying printed bibliographic products

* Making the national union catalogue of foreign titles in public libraries (part of BASIS).

* Supply of weekly printed information that serves as a manual acquisition system for public libraries and school libraries covering all media of interest in those types of libraries.

* Sale of recorded music for library use.

* Providing other products of specific interest for public libraries and school libraries.

* Providing machine readable bibliographic records to customers as download or off line delivery.

* Development and sales of software.

Even though most of the activities at

Bibliotekscentralen are IT based only part of them will be taken into account as pertaining to this report: The host function for Artikelbasen, the provision of machine readable records and the software products.

Modules: There are mostly PC based applications, some products are one-offs while others are intended for more customers.
An acquisition system for The Danish Central Library for Immigrant Literature calculating many currencies might be mentioned here,
an administrative system for library service to users that are served in their homes: Bogen kommer (The book is coming),
BC-Indkøb, a system for public library and school library acquisition,
BC-Fjernlån for managing ILL, implemented in some of the large academic libraries and a few public libraries.

Prices: These software packages each cost about DKK 1-2000.

8.3.2 **FEK**

The institution: Forskningsbibliotekernes edb-kontor (FEK, The Computer Department of the National Library Authority) has since 1984 been an established institution with a budget of its own. This institution was part of Rigsbibliotekarembedet (The Office of the NAtional Librarian), and consequently is now part of the Danish National Library Authority. It now has a staff of 14 f.t.e.

FEK is responsible for the shared development work of the academic libraries as well as for coordinating the automation efforts of these libraries.
Administration and development of ALBA, which is a publicly accessible database, is also one of FEKs tasks.
FEK coordinates the shared cataloguing work, including the reuse of data.

It is also the responsibility of FEK to exchange machine readable national bibliographic data with other countries.

The BIA system (see 1.1.5) to be implemented as an automated system controlling the payment to authors according to their number of volumes in public libraries, will be operated by FEK.

Products and services: FEK offers paid services as well, such as consultancy, host functions for bibliographic databases(see 2.3.1), data delivery, and training courses (see DEMO room, 5.9.2).

FEK has developed the input system FELIX which is used by SAMKAT participants without an input system of their own. The communication software FEKCOMM is offered to the libraries for communicating with the shared system. Both products are free of charge.

FEK has developed the reformatting programmes used to convert the BL/LC tapes to the DENMARC format.

Implementation: Those libraries which catalogue directly into SAMKAT are typically small or middle sized libraries, as long as most of the large libraries have acquired systems of their own. Nearly 50 libraries are now using FELIX/FEKCOMM.

Modules: FELIX is for input, and FEKCOMM for communication. The libraries using this will very often use ALBA/SAMKAT as their catalogue in the sense that they may limit the searches to records from their

own library when they wish. Some of these libraries have software for retrieval and therefore download their own records locally for catalogue searching.

The retrieval system of ALBA/SAMKAT based on DS 2347 and the mail box for ILL have been thoroughly mentioned above (see 3.2.2 and 5.5).

8.3.3 UNI*C

The institution: UNI*C is the Danish Computer Center for Research and Education, originally three computer centres at the universities of Copenhagen and Århus, and the computer centre of the Technological University of Denmark, which have now merged. It is affiliated to the ministry for Education and Research, offering several kinds of computer related services in the fields of education, research and development. It owns several large computers. It has developed and operates the Danish university network, DENet, as well as the Danish node in the EARN network. UNI*C reports that 2 persons are working with library tasks. (A small proportion of the activities of the institution).

Products: UNI*C is offering consultancy concerning database design, multimedia and networks. It has experience with CD-ROM production and offers several training courses as well.

Implementation: FEK and UNI*C have a contract according to which UNI*C is the host of ALBA/SAMKAT, which is placed on the Unisys 2200/444 computer at UNI*C. As mentioned in 2.2.13, FEK paid in 1989 close to DKK 6 million for storage and maintenance on the computer. System and programmes is the responsibility of FEK.

Moreover there is a contract between the two institutions, concerning the DENet and its use by the ALBA/SAMKAT users. For this FEK pays DKK 0.1 million.

Local system databases have to make individual arrangements with UNI*C concerning connection to the DENet.

8.4 Prices on the Danish library market

It is not very easy to find out about the prices of the library systems on the Danish market. The suppliers have in most cases offered individual solutions, so that the systems offered will not easily be compared. Rebates negotiated will vary, too.

And the libraries themselves differ in many ways: Some have several branches, some have special service agreements with university institutes (or the institutes of a mother institution), some have open stacks, some have not, some (The Royal Library and others) have magazines at a distance from the library itself, containing part or nearly all of the library materials, and most of the libraries have a classification system of their own. Therefore the systems specifications may differ a great deal, consequently the cost of the installations are not easily compared.

Moreover, there are several kinds of rebates on the Danish market, and special arrangements for sale to the Danish State.

Even then, from the expenditure on library systems, as seen in section 9, some figures may be deduced. In addition it seems, that it is not necessarily differences in prices which have been the determinant factor in the choice between systems suppliers.

9.0 ECONOMY

Trying to find out how much has been spent on automation in the Danish libraries will only result in estimated figures. While the statistics are fairly reliable and follow international standards, some libraries have not submitted all the necessary figures. Quite apart from that, it is not always possible to get exact figures from libraries, because certain parts of the expenditure may be embedded in figures of the mother institution. So all figures given must be regarded as fair estimates only, not necessarily far from the true results. Amounts will usually refer to the end of 1990 and be given without including the Danish VAT of 22%.

9.1 Academic libraries

9.1.1 The 20 large libraries

The 20 large academic libraries which have been described above, have all in all used **about DKK 70 million** on automation during the years 1987-1990 incl., according to their own reports. About half this amount has been obtained by special grants from ministerial pools in the Ministry of Culture and the Ministry of Education and Research.

For the same 4-year period the total expenditure of those same libraries has amounted to about DKK 1700 million, consequently **the special amount spent on automation has been about 4% of the library budgets.**

It may be deemed reasonable to consider the expenditure on automation in relation to the number of terminals/workstations installed in a library.

As these libraries have a total of about **1050 terminals /workstations**, roughly speaking DKK 66.000 have been spent per terminal/workstation installation. The figure includes network connections, hardware and software, but is nevertheless indicative of the cost involved when a library is being automated. Further expenditure is expected over the next years, as these library systems are not yet fully integrated, and most of them have not yet got all their records in machine readable form. Furthermore more user terminals will be needed as more library functions are being automated. 1050 terminals/workstations including those offering access to the library users, having been installed in libraries with a total of 1238 f.t.e. show a fairly high percentage of automated working places.

Running expenditure has constituted about 5-12% of the installation cost, probably depending on whether a service contract has been signed, and on how comprehensive the service was intended to be. This figure does not include staff.

All the libraries with local systems - even when these do not

amount to more than one or two library functions - are using some manpower in the library to maintain the system, to assist librarians and maybe also to arrange local instruction courses for library staff as well as library users. But the figures obtained show, that this does not usually amount to more than 2-5% of the library staff time. A total of 30 f.t.e. are employed to work in the computer sections of these libraries, not including staff for data entry etc.

9.1.2 The group of middle sized and small libraries

Figures have been obtained for a number of the group of middle sized or small libraries, for investment, type of installation, running costs and number of terminals/workstations. The calculation is based on the statistical grouping of libraries mentioned in 1.2 in order to get estimates valid for the whole group.

Such a calculation gives an estimated 400 terminal/workstation installations in this group of libraries, and a total investment for the period of DKK 20 million. Running costs per year show the same relative figures as for the larger libraries, but on the other hand, in this group the libraries do not have any staff exclusively dedicated to IT work.

As these libraries have a total staff of 348 f.t.e, the number of terminals per staff unit is more than one, but it should be remembered, then, that the 348 f.t.e. equal about 464 persons working in these libraries. Moreover, the smaller the library, the greater the likelihood, that there will be one terminal for the user, when there is one workstation (PC) for the staff.

Some of these libraries show lower figures per installation than those mentioned above for the largest libraries, others show somewhat higher figures. The cost per installation, in most cases only including cataloguing, retrieval and network connection, varies from DKK 20.000 to 85.000 (rarely more) per terminal/workstation. This depends, of course, also on which year the equipment was acquired as prices are still decreasing. But there has also been a natural wish for more powerful and sophisticated workstations, which are now obtainable as the prices are coming down. As mentioned above, these installations are often used for word processing, production of some publications, retrieval in external databases and statistics as well.

9.1.3 Libraries of university institutes

For the institute libraries belonging to the institutes of the University of Copenhagen (a total of 112 institutes) an investment plan of DKK 4.8 million was launched in 1987. DKK 1.1 million was provided by the Ministry of Education and Research, while the university itself supplied the rest.

The total amount is about the same as that spent in the

implementation of a library system in one of the larger university libraries, but the result is rather different: Seen purely from a library point of view catalogue access to the records of the library itself - either in ALBA alone or in the local system of the mother institution as well - and also access to the records of other academic libraries has been obtained. Moreover there is now the possibility of requests for loans of books found in ALBA from the 13 libraries offering this facility. Furthermore some of these libraries may use the PCs for retrieval in external databases, for running statistical programmes, word processing and sometimes for making acquisition lists or newsletters.

It is a reasonable assumption, that the economic figures will be more or less the same for the other institute libraries as reported from the University of Copenhagen. This leads to a figure of DKK 12 millions for investment in all the institute libraries.

9.1.4 Total figures

For the academic libraries some approximate figures have been obtained for expenditure concerning automation as well:

Table 9.1

Libraries	All	20 largest	Pct
Number	179	20	11
Expenditure on IT 1987-1990 (DKK mill.):	90	70	78
Annual running costs:	8	7	87
Terminals/ Workstations:	1450	1050	73
staff IT jobs	30	30	100

In addition to these figures there is the investment of the university institute libraries. As already mentioned their total number is 278. For the institutes at the University of Copenhagen, 110 in all, the figures are DKK 4.8 million in all, and an estimated 110 terminals/workstations (some have 2, very few none). This means an average of DKK 44.000 pr terminal/workstation.

There is reason to believe, that it is fair to calculate a total for all university institute libraries using the figures for University of Copenhagen. Based on this calculation an estimated DKK 12 million is the amount invested in IT for this group. 278 terminals/workstations would consequently be the assumed number of terminals in the institute libraries, all taken together. The total staff is reported to be about

78 f.t.e., but one must remember, that some libraries have very little staff, less than "one person, half-time", meaning that one person may work for two or three small institute libraries.

9.1.3.1 The academic library market

Taking into account all the figures estimated for the automation of the academic libraries, some totals may be assumed.

The total investment in the period 1987-1990 would be 70 + 20 + 12 = DKK 102 million. As investments seem to be spread rather irregularly over the 4 year period, one may as well say DKK 26 million pr year in the 4-year period. In addition to this there are the running costs, which are estimated at 8% of the total investment, i.e. DKK 8 millions per year, not including staff (the same figure is arrived at, when the specific figures from some of the libraries are used). Of these **DKK 34 millions annually** probably the 4 will have been spent on produce not specifically library oriented, such as terminals, printers, cables etc. from other companies than the specific library suppliers.

Consequently DKK 30 millions may be an estimate of the annual amount spent on purchase from the library suppliers'.
It is interesting to see that not much more than 40 persons of these companies will be specifically working in the academic librariy market.

Apart from this, 30 persons of the libraries' staff are working specifically with automation. To this number one should add the 14 f.t.e. of FEK.

Moreover BC is producing the greater part of the Danish national bibliography, this work is part of the academic libraries market as well as of that of the public and school libraries market. So maybe a total of about a hundred persons are working with library IT as their jobs.

To these estimates it should be added, that retroconversion in the academic libraries, as mentioned above, is a huge task, which demands a national plan and in itself may cost DKK 15-50 million or more, dependant on how much will be converted and how. When considerable amounts of records for the older literature appear, there will be still more need for storage and systems capacity.

9.1.4 FEKs package

Finally, it should be mentioned, that at the beginning of 1991 FEK will be introducing a package offer for those libraries, which have not yet begun cataloguing to ALBA (the campaign mentioned in 2.2.8 above). This offer includes: DKK 20.000 for one PC, one printer, plus software for cataloguing to ALBA as well as connection to the DENet, and in addition 5 days of

training.

The library itself will be responsible for both furniture for the workplace and telecommunication costs. This package deal is indicative of the steadily decreasing cost of introduction in libraries of automation at a low level.

9.2 Public libraries

9.2.1 Introduction

Costs of library automation are embedded in several parts of a library's budget at a level not reported in the official statistics, and therefore only estimates and examples can be given.

The components in a library IT budget is:

1. Preparation costs (staff etc)

2. Educational costs

3. Investments in hardware and software

4. Investments in datacommunication

5. Installations costs

6. Office modifications costs, furniture etc

7. Costs for data

8. Running expenses

9. Staff costs for running the system

10 Staff costs for using the system

Suppliers normally quote only part of 2, all of 3, part of 4, part of 7 and part of 9.

1. can never be calculated. The local part of 7 will often be hidden. 10 should not be included in any economic consideration except in cost efficiency calculations.

9.2.2 Cost estimations

Phase 1

The first phase was the introduction of BASIS. The present 900+ terminals (passwords) have appeared during the period 1985-1990+ they represent a total value at the time of purchase of approximately DKK 45 million everything taken into account. The annual running costs can be estimated at DKK 15 million including paying for the use of BASIS. The

same equipment is used for connections to ALBA and Artikelbasen.

9.2.2.1 Cost of Data

The local authorities are paying Bibliotekscentralen for several types of data:

* The enhancement of the national bibliographic records

* For the extra enhancement with subject headings and for compensation for not using printed material.

These two types of payments are calculated as a flat fee per capita in the local authorities. The costs would have occured anyhow, so they should not be totally included in an IT budget. The first equal DKK 11 million per year, the second equal DKK 5 million a year.

For direct delivery of data a rate of DKK 0.7 per record plus delivery costs is used. However, if more libraries take delivery of e.g. the same extract from BASIS the price per record drops.

9.2.2.2 Systems costs

Local library systems are such complex mechandise that list prices never apply to reality. Examination of installations carried out recently shows that the costs for a fully developed system of the present mainstream including connection to branches may be estimated at approximately DKK 1 million per 10.000 inhabitants served. The price will vary somewhat over the library size range.

It should be observed that it is common practise to relate numerical expressions in public library matters to the population served. This will of course - depending on the issue - be either too fair or unfair to libraries differing very much from the average. But for average considerations this type of observations work perfectly well.

Examples

A. A very large library had a call for tender 2 years ago. Also international companies participated. The total costs varied from DKK 0.7 million to DKK 1 million per 10.000 inhabitant for a fully integrated system.

B. A big library has a fully integrated system in use. The actual costs have been DKK 0.75 million per 10.000 inhabitants from the beginning to the present fully integrated system. However, the library was co-developping and had a discount. The commercial value is DKK 1 million per 10.000 inhabitants.

C. In the process of supporting introduction of library IT with state grants a large number of proposals passed through

the SBT. A very small local authority applied for support for a very integrated system. Due to the complex structure and some small branches as well as cooperation with the school libraries the network costs ran rather high. The costs were DKK 1.3 million per 10.000 inhabitants. The size of that authority was a mere 7000.

9.2.3 Overall estimates

The costs of the present local systems may be calculated according to this principle. However, some modifications should be observed:

Not all local systems installed may be declared as 'fully integrated' for at least two reasons:

* Some never aimed to be so. Some libraries want a discount solution.

* Some have not carried out all the investments for the 'fully integrated' system. They are perhaps less than half way through.

The present group of libraries working with local systems serves just under 3 million inhabitants. If we take discount solutions into consideration they have committed themselves to total investments of an estimated DKK 0.7 million per 10.000 inhabitants. That gives a total estimate of DKK 210 millions for the present group. As some of the larger libraries have just started the total estimated expenditure until now (1991 budget) must be considered somewhat lower, a complicated estimate results in the figure DKK 150 million.

An overall estimate of investments for local systems results in DKK 360 millions to be reached some day in the future, but before this first generation investment will have ended the first group of libraries will start to re-invest in their second generation Thus increasing the investments further up.

The bulk of that investment is going to take place during the next 4 years (1992/95).

9.2.4 Costs for conversions

As public libraries have to have access to all stock and the ability to circulate the whole stock in an integrated way the complete conversion of all holdings is a MUST.

The methods for doing so differ very much. 1990 saw a very popular succession of campaigns: A number of libraries closed for a fortnight and dedicated the whole staff to conversions. Methods of measuring are quite easy for a fortnightly period, but there will always be a preparation phase and a conclusion phase. From the 1990 examples the conversion costs - including buying data from external sources, stocktaking, revision, conversion of each copy, applying of bar code labels, the

general tidying up amount, to an estimated DKK 4 per item converted. This gives an overall conversion investment of DKK 140 millions of which 20 % may at present be considered as having been carried out.

9.2.5 Running costs

Typically service and maintenance of computer hardware and software amount to annual fees of 10% of the investments. On top of this comes the use of suppliers' systems support with an average of an extra 10% of the software price component. More important are the internal costs, mainly staff costs. As mentioned earlier the costs for those who use the systems should only be calculated for the purpose of cost efficiency. The costs for those who keep the systems running should be calculated in the IT budget.

The initial phases are nearly always very time comsuming. For strange reasons everyone claims that starting computerized solutions always means a very high workload. At the beginning especially smaller libraries are bound to discover a new inflexibility as systems administrators have to be available during the whole period of the library being in use, not only during the opening hours. Some ideas of sharing computer resources with the town hall have not been carried out. The library will be staffed for a considerably longer period than will the town hall.

With the present type of solutions the staff costs of keeping the systems going may be estimated at less than 2% of the overall staff costs. This may be recalculated as DKK 120.000 per 10.000 inhabitants.

9.3 School libraries

At present 2 systems are dominating the school library market: Bibliomatic from Dantek and Micromaster from Kommunedata. Both are stand alone PC based systems and just tailormade for the school library purpose. Other companies have indicated an interest in making dedicated school library systems, but nothing has emerged so far.

The typical solution in a local authority is to have one system at each school, in larger authorities with a school librarian in charge and perhaps a central office for school libraries there might, however, be some more systems.

The typical solution including a PC and software mean an amount of DKK 30.000 per system.

The present estimate of 300 systems out of a possible total of 1800 schools represents a value of DKK 900.000. This is quite a small amount, but one must also remember the conversion cost. As the level of conversion is far more modest than in public libraries the conversion costs must consequently be modest per unit, but no official calculation has emerged yet.

As stated earlier there is a tendency towards more elaborated solutions. At the present level the complete investment may be calculated at DKK 5.4 million. More elaborated solutions would lead to much higher investments.

10.0 FUTURE DEVELOPMENT

At the central level the outcome of the cooperative work between FEK and BC in the first half of 1991 could really mean a shared system for all libraries. This would intend to pursue the following aims:

- conform to the relevant international standards,

- be portable,

- aim at freedom of choice of local systems as far as possible,

- be friendly towards already existing local systems,

- be based on POSIX (UNIX).

For the time being the cooperation has got the nom de guerre DANBIB.

A shared system for legal deposit material as mentioned above will be part of the total shared system when this is established.

The BIA system for The Public Lending Right Administration is expected to be part of the cooperative system as well.

FEK and BC are now working closely together, considering a data model intending to fulfil the above objectives. The market is being thoroughly looked at, as well as experience from other countries is being studied and discussed.

The future network development is part of the plans. As the DENet is observing standards which will develop into an OSI standard, this network technology is expected to be the basis for the cooperation.

The introduction of a public ISDN network, as is expected to take place in 1991 will greatly influence the development, leading to better communication services.

Decisions on the future cooperation and the form of organization and financing of the shared project are supposed to take place by mid-1991.

One of the developments to be seen in the near future is the automatic switching of loan requests from the ALBA/SAMKATs mail box into the local systems, as mentioned in 5.5.

A national plan for retroconversion may be expected as well.

At the local level more libraries will probably get systems of their own, as well as those libraries who have introduced local library systems already will probably acquire more

system modules and some of them will change to new systems.

Further development of the OPACs is expected to take place at the local level as well, with more advanced retrieval systems and more integrated contents of the catalogues.

The new media already introduced, such as CD-ROM, videodiscs, videotapes, M/O discs, will probably be more widely used.

Moreover new user services will hopefully be introduced as well.

CONCLUSIONS

The two central database systems ALBA and BASIS are covering the latest literature fairly comprehensively, containing records from about 1980 and 1970 and onward, respectively, for Danish and foreign books and periodicals in Danish libraries, as well as articles in Danish periodicals. Other library materials are to be found, comprehensively as far as Danish materials are concerned, but to a lesser extent as regards the holdings of foreign music and cartographic materials as well as pictures and other special collections of library materials. **These databases are by now indispensable to all library work in Denmark.**

There is a great need for retroconversion, particularly in the academic libraries, where at least 10 million records need retroconversion. The problem is not equally urgent in the public libraries, which hold fewer old publications as well as fewer foreign books. Furthermore the retroconversion process is much more easily performed in the public libraries due to the fact that 95% of the cards will be found in BASIS.

The OPAC is generally accepted by both library staff and users, and it is increasingly prevalent. Most libraries use the standard ISO 8777 for retrieval language.

Further sophistication of the OPACs is desirable as well as more comprehensive coverage, for instance foreign periodical articles. Easier access to these could be achieved as well by interconnection of OPACs with a common retrieval interface.

Most academic libraries are accessible through the DENet either directly or via ALBA. Public libraries' access to DENet is hopefully going to be established in the near future as is access to the databases of other European libraries. **It is essential that Danish libraries get easy and cheap access to all Danish databases in the near future.** Likewise it is desirable to be able to access external databases, library catalogues as well as commercial databases by the same network.

Circulation systems will rapidly become widespread in the public libraries, just as they will find their way into the academic libraries, though at a somewhat slower rate due to the fact that some libraries will choose to wait until a major part of their records has been retroconverted.

Automation of other library routines such as acquisition routines and serials control are following more slowly.

Budget control systems and management control systems are rarely seen in Danish libraries at the present time.

A great deal of **experimentation has taken place,** some of this at grassroot level. Particularly noteworthy are the many R&D

projects in the public libraries, which were made possible through the state grants. Some innovative projects have been carried out in the academic libraries as well, some of which were supported by NORDINFO.

It is an interesting fact that **some of the libraries have changed their systems**. A major reason for changing your system might be the emerging of a newer technology, as for instance UNIX based systems, which the libraries are bound to prefer among other things because they want to observe the standards. Should the software at some stage become portable, i.e. more machine independent, such changes may become more frequent.

Changes may also partly be due to the fact that fully developed integrated systems had not been acquired by any library in the first place, and some of the libraries might have been disappointed at the rate of the development on the part of the supplier.

There has been considerable financial support from the two ministries responsible for most of the libraries: The Ministry of Culture and the Ministry of Research and Education. These ministries have funded about half of the investments in the academic libraries during the period. On the other hand the public libraries have been aided by the local authorities, which have been prepared to support implementation or to let library systems become part of the local municipal investment. As decentralization has been more prevalent during this period than before, the future may well confirm this trend.

As far as 1991 and the years thereafter are concerned **there is no sign of the library market being saturated**. This is due to a change of system in some larger libraries and also due to the middle sized academic libraries being ripe for further automation. Moreover public libraries are getting ready for more automation and for innovative user friendly tools.

So even though much has been achieved during these last four years, there is still quite a way to go before the IT has produced the optimum impact in the Danish libraries.

ANNEX 1

Libraries mentioned in the text:

The 20 largest academic libraries:

The National Library: The Royal Library
(KB, Det Kongelige Bibliotek)

The State and University Library
(SB, Statsbiblioteket, Århus)

Central Botanical Library of The University of Copenhagen
(Bot, Botanisk Centralbibliotek)

The Library of the Royal School of Librarianship
(DBi, Danmarks Biblioteksskoles Bibliotek)

The Danish National Library of Science and Medicine
(DNLB, Danmarks Natur- og Lægevidenskabelige Bibliotek)

The National Library of Education
(DPB/DLB, Danmarks Lærerhøjskoles bibliotek og Danmarks pædagogiske Bibliotek)

The National Technological Library of Denmark
(DTB, Danmarks Tekniske Højskoles Bibliotek)

The Danish Veterinary and Agricultural Library
(DVJB, Danmarks Veterinær- og Jordbrugsbibliotek)

The Library of Danmarks Statistik
(DStat, Danmarks Statistiks Bibliotek)

Library and Information Service of the Danish Parliament
FBO, Folketingets Bibliotek og Oplysningstjeneste

Library of the Copenhagen Business School
(HHB, Handelshøjskolens Bibliotek, København)

Library of the Aarhus Business School
(HHA, Handelshøjskolens Bibliotek, Århus)

The Royal Military Library
(KGB, Det Kongelige Garnisonsbibliotek)

The Library of The Royal Academy of Fine Arts
(KAB, Kunstakademiets BIbliotek)

The National Museum. The Library
(NatMus, Nationalmuseet, fællesbibliotek)

Odense University Library
(OUB, Odense Universitetsbibliotek)

RISØ Library, RISØ National Laboratory
(Risø Bibliotek)

Roskilde University Library
(RUB, Roskilde Universitetsbibliotek)

Aalborg University Library
(AUB, Aalborg Universitetsbibliotek)

The Labour Movement Library and Archive
(ABA, Arbejderbevægelsens Bibliotek of Arkiv)

Further academic libraries specially mentioned in this report:

The administrative Library
(Adm, Det Administrative Bibliotek)

KVINFO, The Center for Interdisciplinary Information on Women's Studies
(KVINFO)

The Library of The Directorate for Patents
(PDB, Patentdirektoratet. Dokumentation og Bibliotek)

The Libraries of The Technical Colleges, Technical Libraries
Teknikum-bibliotekerne

The Danish Pharmaceutical Library
(Danmarks Farmaceutiske Bibliotek)

University Library of South Jutland
(Sydjysk Universitetscenter, SUC. Biblioteket)

Public libraries mentioned in the text:

Public libraries in Bjerringbro, Brande, Egvad, Esbjerg, Frederiksberg, Gentofte, Herning, København (Copenhagen), Lemvig, Nordborg, Randers, Odense, Samsø, Silkeborg, Slagelse, Struer, Aalborg, Aarhus

Other Library Institutions mentioned in the report:

The Royal School for Librarianship, or, The Library School, with Departments in Copenhagen and Aalborg
(Danmarks Biblioteksskole)

The Danish Central Library for Immigrant Literature
(Folkebibliotekernes Indvandrerbibliotek)

The Danish Depository Library for Public Libraries
(Folkebibliotekernes Depotbibliotek)

The Library Bureau
(BC, Bibliotekscentralen)

Interviews

Many persons from the libraries mentioned and from the companies reviewed have been contacted for information, and

Moreover the following persons have been interviewed:

Ejvind Slottved, principal, the administration of the University of Copenhagen,

Hans J.S. Andersen, Head of Section, The Royal School of Librarianship,

Anker Hedegaard, director of technical services, The Danish Booksellers' Association.

Annex 2

List of companies and institutions reviewed

Suppliers of library systems or parts thereof, actually used in the Danish libraries:

BRS Software Scandinavia,

Dantek,

Datacentralen af 1959 I/S,

Dataconcept A/S,

Data Consult Informatik A/S,

DC Informatik,

DDE: Dansk Data Elektronik A/S,

Kommunedata A/S, KMD,

Mentor Informatik A/S,

Norsk Data A/S,

Norsk Systemutvikling, Oslo

RCInternational, RCI,

Scanvest,

Unisys

Suppliers of special products or services:

CODECO,

CRI, Computer Resources Internatonal,

Synergi,

The Royal School of Librarianship

Kommunedata

Suppliers of network and telecommunications:

Fischer & Lorenz A/S,

Køhler Electronik aps,

Trend Communications as,

Jydsk Telefon and KTAS
(The tele companies, now Teledanmark)

Special companies or institutions of a central character:

Bibliotekscentralen,

Forskningsbibliotekernes edb-kontor,
(FEK, The Computer Department of The National Library Authority, former name: The Computer Department for The Research Libraries),

Kommunedata I/S,

UNI*C
(The Danish Computer Center for Research and Education)

Institutions offering consultancy and training:

Dansk Diane-center,

Dansk teknologiformidling,

Erhvervs-Info, Forskerparken, Århus,

Royal School of Librarianship,

FEK,

as well as most of the suppliers.

ANNEX 3

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ANNEX 4

Questionnaires

Information for the LIB2-UPDATE/4 study comes from among other sources the following questionnaires:

1. Questionnaire to suppliers of local systems and other services.

2. Questionnaire (I) to academic libraries on IT usage

3. Questionnaire (II) to academic libraries on IT usage

4. Questionnaire to public libraries on IT usage

Statens Bibliotekstjeneste

LIB2 UPDATE

Statens Bibliotekstjeneste, der har det statslige koordineringsansvar for alle bibliotekstyper i Danmark er i færd med at udarbejde et såkaldt 'edb-perspektiv' for det samlede danske biblioteksvæsen.

Herudover har Statens Bibliotekstjeneste indgået en kontrakt med EF-Kommissionen (DG XIII) om at levere det danske bidrag til en samlet europæisk ajourføring af den statusrapport om biblioteksautomation i EF-medlemslandene, som blev udarbejdet for nogle år siden. Denne studie blev kaldt 'LIB2'. Den igangværende ajourføring kaldes 'LIB2 Update'.

I denne sammenhæng vil det være værdifuldt, at få oplysninger om forholdene på det danske marked om informationsteknologi der retter sig mod biblioteksektoren. Vi vil derfor bede Dem besvare nedenstående spørgsmål:

1. Hvilke produkter og tjenesteydelser tilbyder De til det danske biblioteksmarked. Angiv venligst produktnavne og typer af ydelser. Angiv venligst også produkt- og ydelsespriser på et generelt niveau.

2. Hvilke af disse produkter og ydelser er udviklet og produceret i Danmark, hvilke er importerede. Er dette i givet fald sket fra udenlandsk moderfirma eller gennem forhandlingsaftale.

3. Retter disse produkter og ydelser sig mod en eller flere af de 3 danske bibliotekssektorer: Forskningsbiblioteker, folkebiblioteker eller skolebiblioteker?

4. Vedlæg venligst skriftligt materiale om de enkelte produkter og ydelser.

5. Angiv venligst en liste over installationer og hvor ydelser er udførte. Hvilke referencer til kommende kunder kan der gives?

6. Indgår de nævnte produkter og ydelser i eksportaktivitet fra Danmark. Er denne eksportaktivitet rettet mod EF lande og/eller mod andre lande. En oversigt over initiativer og udenlandske kunder ville være af interesse.

7. Har Deres virksomhed erfaring i deltagelse i EF-projektarbejde.

8. Påtænker Deres virksomhed at søge aktiv deltagelse i EF handlingsplanen for biblioteker, der vil blive en del af det kommende FRAMEWORK program?

9. Er Deres virksomhed dediceret til biblioteksmarkedet? Angiv dette fx gennem biblioteksmarkedets andel af den samlede virksomhed.

10. Hvor mange personer er i Deres virksomhed beskæftigede med biblioteksrelaterede opgaver.

Da vi anser det for væsentligt, at få Deres svar med i vores statusrapport, beder vi Dem venligst besvare denne henvendelse inden udgangen af november måned.

Skulle der være spørgsmål, De måtte ønske at drøfte med os, er De meget velkommen hertil.

Med venlig hilsen

Morten Hein
Kontorchef

Olga Porotnikoff
Førstebibliotekar

Statens Bibliotekstjeneste

Til forskningsbibliotekerne i valggruppe A - E

6. februar 1991
OP/op jr nr

LIB2-UPDATE

Statens Bibliotekstjeneste har indgået en kontrakt med EF-Kommissionens DG XIII B om at levere det danske bidrag til en samlet europæisk ajourføring af den statusrapport om biblioteksautomatisering i EF-medlemslandene, som blev udarbejdet for nogle år siden. Denne rapport blev kaldt LIB2, og den igangværende ajourføring kaldes LIB2-UPDATE.

For at få et så fyldestgørende overblik som muligt over de investeringer og løbende udgifter, som biblioteksautomatiseringen har medført, anmodes biblioteket derfor om at bidrage med nogle oplysninger, gerne i "runde tal". Det er ikke hensigten i rapporten at give tal for enkeltbibliotekers anskaffelser, men at få bedre mulighed for overslag over gennemsnitsinvestering og drift pr arbejdsplads i forskningsbiblioteker af forskellige typer.

1. Hvilke beløb er i årene 1986-90 incl. anvendt til anskaffelse af edb-udstyr (HW,SW og kommunikationsudstyr)? Hvis der er iberegnet beløb til anskaffelse af inventar (borde, stole, briller etc) bedes det noteret.

2. Hvad er de årlige edb-driftsudgifter, lønudgifter fraregnet?

3. Hvor mange årsværk beskæftiges med edb-arbejde? Dette forstås her som operatør- og programmørarbejde, systempleje- og forvaltning o.lign., ikke inddateringsarbejde mv.

4. Hvor mange terminaler/arbejdsstationer råder biblioteket over, og hvor mange af disse er specielt til publikumsbrug?

5. For biblioteker med et lokalsystem: Hvilke muligheder er der for at komme i forbindelse med systemet, og hvor mange indgange er der?

6. Hvilke systemdele omfatter lokalsystemet?

6. Hvem er bibliotekets hovedleverandør?

7. Hvilke andre forhandlere har leveret væsentlige systemdele eller softwareprodukter?

Af hensyn til den videre behandling ville jeg være taknemmelig for et hurtigt svar, gerne inden den 25. februar 1991.

Med venlig hilsen

Olga Porotnikoff

Olga Porotnikoff

Statens Bibliotekstjeneste

SPØRGESKEMA VEDR. BIBLIOTEKSSYSTEMER

Navn: Att: Adr:	Dato:
	Tlf:

BRUGES DER IKKE EDB, SÆTTES DER KRYDS HER ( )

Bibliotekssystemets navn:	
Leverandør:	Anskaffelsesår:

Hvilke af nedennævnte funktioner/moduler er der i systemet:			
Søgemodul	Katalogiseringsmodul	Udlånskontrolmodul	
Indlånsmodul	Tidsskriftcirkulationsmodul	Importmodul	
Eksportmodul	Udskriftsmodul	Statistikmodul	
Accessionskontrolmodul	Tekstbehandling	regneark	
Rapportgenerator	Andet:		

Generelt:		
Er styresystemet: DOS	Unix	
Hvilket hardware køres der på:		
Er biblioteket: Samkatbibliotek	Felixbibliotek	
Købes der dataleverancer hos Bibliotekscentralen - hvis ja - hvilke:		
Noter:		

Skemaet returneres til:
Forskningsbibliotekernes Edb-Kontor, Att: Henrik Larsen
Nyhavn 31 E, 1051 København K. - Telefon : 33 93 46 33

STATENS BIBLIOTEKSTJENESTE 27.9.1990

Statens Bibliotekstjeneste MH/JAJ

SPØRGESKEMA OM INFORMATIONSTEKNOLOGI

Bibliotek			
Udfyldt af		dato	28.09.1990
1 Ingen af de nedenstående spørgsmål kan besvares bekræftende		☐ sæt x	

	1990	1991	1992
2 BASIS antal terminaler			
3 Lokale edb-systemer til den egentlige materialebestand (sæt x)			
Beholdningsregistrering igang			
Beholdningsregistrering færdig			
Udlånsstyring i drift			
System: BIBS			
DDE _____			
Kommunedata			
Norsk Data _____			
RCInternational			
_____			
Vides ikke/andet			
4 Andre lokale edb-systemer med bibliografisk indhold (sæt x)			
5 Datastue og lignende (sæt x)			
6 Søgning i eksterne databaser (sæt x)			
ALBA			
ALIS			
Artikelbasen _____			
AUBOLINE			
COSMOS			
DIALOG _____			
DISØ			
ODIN			
POLTXT _____			
REX			
RETSINFO			
RUBIKON _____			
SOL			
SOS _____			
Andre: _____			
_____			
_____			
_____			

Bedes tilbagesendt senest den 19.10.1990