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In this issue:

University Libraries in the Computer Age

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LIBRARY AUTOMATION IN THE UNIVERSITY LIBRARIES OF ISRAEL

Judith LEVI

The libraries at the seven universities in Israel have reached an agreement with regard to co-operation and networking, using common library automation software. The software is a multilingual multiscript integrated online system, developed at the Hebrew University of Jerusalem and installed on Digital VAX computers. The network system allows readers to search the catalogues of all the libraries and enables the librarians to save cataloguing expense and effort by copying records from one library to another.

Israeli University Libraries

There are seven universities in Israel, as well as an open (everyman's) university and a number of community and special colleges. This article is limited to library automation at the seven universities as per Table 1 below. The institutions in question are:

- the Hebrew University of Jerusalem, Jerusalem;
- the Technion — Israel Institute of Technology, Haifa;
- Tel Aviv University, Ramat Aviv;
- Bar Ilan University, Ramat Gan;
- Haifa University, Haifa;
- Ben Gurion University of the Negev, Beer Sheva;
- Weizman Institute of Science, Rehovoth.

In the last six years there has been rapid development of automation in the university libraries in Israel. Certain Israeli experiences may be relevant to other countries as well, especially in the area of networking.

Background

Library automation in Israeli academic libraries began in the early 1970's. The Union List of Serials in Israeli Libraries and the Circulation Department of the Jewish National and University Library were automated, both using punched card systems.

Towards the end of the 1970's, Haifa University began several automation projects, developing library management systems (cataloguing, circulation, etc.), utilizing United States Library of Congress MARC records for cataloguing

Table 1

VAX Computers Supporting ALEPH

1. Universities

Institution		Present Hardware			Projected Hardware 4/89			Average Number of Students per terminal
Name	No. of students	Computer	Disk capacity	No. of terminals	Computer	Addit. terminals	Total terminals	
Hebrew University -Libraries -Research	16,870	2XV 785	6.5	124		12	190	89
		V 750	1	16		4		
		M.V. II	1	30		4		
		V 750	0.5					
		M.V. II	0.7					
		V 730	0.5					
Tel Aviv University	19,400	V 750	1	36		4	70	277
		M.V. II	0.7	24		6		
		V 730	0.5					
Technion	9,090	V 750	1.5	48	V 780	12	60	152
Ben Gurion University	5,200	V 8200	1	38		12	50	104
Haifa University	6,550	V 750	2	36	V 8250	14	50	131
Bar Ilan University	9,480	M.V. 3600	1.3	24		24	48	198
Weizman Institute	570	M.V. II		8	M.V. 3600	4	12	48
Inter-University		V 750	2	16		4	20	
TOTAL:	67,160	15	19.7	400	—	100	500	134

Notes

1. The libraries will be adding 60—75 terminals each year.
2. ALEPH research applications will grow by 12—24 terminals/year.
3. The first VAX computer was installed in September 1985.

copy. A bibliographical database system, including a thesaurus structure, was also developed in order to create special interest indexes, indexes to periodicals, etc.

At the same time, the Hebrew University of Jerusalem began to develop ALEPH (Automated Library Expandable Program — Hebrew University of Jerusalem), an integrated real-time online library management system. The impetus behind the development of ALEPH was the plan of the Hebrew University to unite 23 separate libraries, creating one library, with one collection and one unified catalogue. The libraries had a total of 280,000 titles, comprising 400,000 volumes. As the libraries had been using different classification schemes

and different cataloguing rules, all the collections had to be reclassified; some had to be recatalogued; and all the volumes had to be re-marked for shelving. It was immediately apparent that this task could only be accomplished with the aid of a computer.

Cataloguing and shelving information were put in off-line so that a new catalogue and spine labels could be produced. Concurrently the university searched for an automated library system to serve its needs. Available systems were reviewed and rejected, and the university decided to develop its own system. The ALEPH system was developed at the Hebrew University of Jerusalem by a team of librarians, programmers, and analysts.

As of 1987 the ALEPH system is maintained and developed by Aleph-Yissum Ltd., a company wholly-owned by the Hebrew University of Jerusalem. The software runs on the full range of Digital VAX computers. The software has been adapted to run on IBM (or compatible) PC's to provide a solution for small research of library applications.

Because of the structure of the library system at the Hebrew University (separate libraries for different disciplines), and because of the nature of the university libraries in Israel (a small number of institutions in a relatively small geographic area), the needs of a network system were taken into account from the outset. From the point of view of networking, the system has gone through several basic structural changes at different levels.

Firstly, from the point of view of computer hardware, the world of the 1980's differs from that of the 1970's, having moved from large centralized systems to smaller linked computers. ALEPH was first developed on a Control Data mainframe, the equipment available at the Hebrew University of Jerusalem at the time. At first the system was used only by libraries at the Hebrew University. When libraries at other universities began using the ALEPH system as well, they also used the same mainframe computer located in Jerusalem. In 1984 the mainframe was phased out, and all the libraries are now using Digital Equipment VAX computers, linked to form a nation-wide university libraries network.

Secondly, from the point of view of system architecture, the first version of ALEPH was rigid in its data base structure, and all changes had to be made at the programming level. The system was also very "programmer dependent" for producing printed products, etc. It was rewritten with built-in flexibility and is table driven and programmer independent for most of the tailoring that a library needs.

Thirdly, from the point of view of library networking and catalogues, three libraries, at the initial stage, shared one data base. If more than one library had the same title, the cataloguing record was put in only once, and each library added its particular copies. This procedure required complete accord with regard to cataloguing, and the Hebrew University's Jewish National and University Library served as the final authority. The data base could be searched in its entirety (i.e. as a union catalogue) or "sliced" to display only the items held by one library. After the system had been running for over a year, additional libraries entered the system, and problems related to the uniformity of subject access began to crop up. Up to that time this had not been an issue, since each of the three libraries used entirely different subject access: LC subject

headings, Dewey, and UDC. The librarians using the system conferred on whether to have one common data base for all the libraries, requiring full agreement on rules and standards, or whether to have a separate data base (or catalogue) for each library. Economy of storage space was becoming less of an issue as higher capacity disks came on the market. The issue was discussed for one full year, and in June 1983 the decision was taken to split the catalogues. The latter, which were resident in one mainframe computer, permitted easy "switching" from one library to another and for the copying of records from the catalogue of one library to another.

These three streams of development and related principles contributed to the make-up of library automation and networking in Israel.

Planning and Grants Committee

Because about 60% of the budget of the universities comes from the state, there is a high level of coordination in many academic matters. The bureaucratic set-up filters down from the Planning and Grants Committee of the Council of Higher Education in Israel. In 1984, this Committee decided that it would be beneficial if all the university libraries would use the same automated system. Savings would be realized in development and maintenance costs, and networking could be more easily implemented. ALEPH, which had been developed at the Hebrew University and was already being used by four institutions, was chosen as the most suitable. The Grants Committee is exactly as its name states. It cannot require that any one institution implement or not implement a programme. However, the Committee can provide "the stick and the carrot" in the form of funding. In the case of library automation, the Committee announced that it would provide partial funding for hardware and software for any institution wishing to install ALEPH for library automation. The Committee also set up an ALEPH Steering Committee to coordinate the development requests of the university libraries.

The Steering Committee, which is chaired by a professor from one of the universities, has a membership made up of library directors, directors of some of the university computing centres, a representative of the Planning and Grants Committee, and a representative of the ALEPH software company, Aleph-Yissum.

The Planning and Grants Committee also provided direct funding for co-operative projects and actually covers the purchase and running costs of the inter-university computer which handles these projects: the Union List of Serials in Israel Libraries, LC MARC records, and an Index to Hebrew Periodicals.

Networking

ALEPH utilizes DECNET for efficient and sophisticated networking. Today the system is installed at all seven institutions of higher education. Dedicated lines of communication link the various library computers, which

are all of the Digital VAX family. The library networking forms a very important part of the larger overall Israeli universities network. This network is presently being revamped to work on lines of a higher speed (56K transmission rate).

The networking has three aspects. Firstly, any data base can be searched from any terminal. In effect this means that all academic library resources are available to the entire Israeli academic community. Secondly, bibliographical records can be copied from one data base to another, providing cataloguing copy and saving duplication of effort in the cataloguing process. Thirdly, the availability of information on the resources of the various libraries facilitates interlibrary lending. The interlibrary loan module of the system further facilitates interlibrary loans. As distances in Israel are not great, a non-automated active interlibrary loan system was set up almost two decades ago.

ALEPH — Description of the System

The ALEPH system covers the full range of library activities, from data retrieval through library management and statistics. The following is a functional description of the system, including information on some of its special features.

Multilanguage Capability

Israel is a country of immigrants, and although Hebrew is the official language, people are conversant in many other languages as well, and knowledge of English is compulsory for all university students. Although the language of instruction is Hebrew, the university community has a large number of foreign students and visiting faculty who are more conversant with English than with Hebrew. For these reasons the system was designed as multilingual for interactive use. That is, the user seated at the terminal can choose in which language he would like to input and to receive instructions, independent of the script or language of the material itself. Switching from one language to another can be done at any time, in all functions (online search, cataloguing, circulation, etc.). Originally designed for English and Hebrew, the flexibility of the system allows up to five different languages of conversation to be used simultaneously at one installation. These languages are determined by the library itself, and include any languages written either from left to right (e.g. English, German, French, etc.), or right to left (e.g. Arabic, Hebrew).

Multiscript Capability

The university libraries in Israel use standard terminals which have been adjusted to display Hebrew as well as Latin characters in their proper forms. The system can actually handle up to 10 sets of scripts, each script with up to 255 characters. This, of course, requires a more sophisticated terminal for input and display — a PC (IBM or IBM compatible) with a Hercules Plus card. The Arabic capability has already been developed, and other scripts will be added as required.

Search — Online Public Access Catalogue

An online catalogue search can be conducted in two basically different ways. The browsing search is similar to a manual card catalogue search in which the user decides which catalogue to approach (authors, titles, subjects, etc.), and enters the text of the heading. A list of headings is displayed, and at the request of the user, an alphabetized list of the postings related to a heading is displayed. In the retrieval mode of search, the user enters a search argument, (using a guided form screen) with Boolean operands, and the system searches for matches, displaying a list of the resulting postings. ALEPH is an integrated system; therefore, up-to-date information on copy availability (including circulating copies) is displayed in the search function.

The data base structure is dependent on parameter tables which define data bases for individual applications. This characteristic permits different types of applicants of ALEPH for varying kinds of data bases and permits the tailoring of each application for specific purposes.

Cataloguing and Inventory

The cataloguing function, in which bibliographical records are entered into the system, is either free-form (much like putting the card into the typewriter), or form-prompted. During the cataloguing process, the user can consult the authority files, and copy information from them into the cataloguing record. Copies are registered in the bibliographical record, and each copy is flagged with information for the circulation system. Catalogue records can be copied, from the same catalogue or from any catalogue in the network, including the LC MARC catalogue.

Authority Files

The structure of the authority files permits cross references of various types: see (and the opposite seen from), see also (or use for), related term, broader term, narrower term. The authority record can also have notes appended (such as scope notes, or cataloguing source notes).

Circulation

Although barcodes can be used to identify the items, they can also be identified by their specific numbers built by the system. The circulation system provides for short term loan collection (reserve reading), holds, fines, and traps. The system includes notices to readers, uses statistics, etc.

Serials

The serials module tracks currently received periodicals, including claiming. Routing of newly arrived items is part of this module, as well as binding instructions and follow-up.

Acquisition

The acquisitions module includes a vendors file, a budget file, and tables for currency equivalents. The acquisition procedure can be separated into acquisition initiation (or request), and implementation. Projected price, final price, and invoice information are part of the system. Up-to-date budget information is available, as the system dynamically computes budgets, taking into account both actual payments and proposed acquisitions.

Interlibrary Loan

The interlibrary loan module is being planned for use by a network of libraries using the ALEPH system.

Library Co-operation and Co-ordination

In 1970, a Standing Committee of the National and University Libraries in Israel was created for co-ordination and co-operation. Its structure includes the appointment of sub-committees that deal with specific matters of library management — cataloguing, acquisitions, interlibrary loan, union list of serials, etc. The Library Automation Sub-Committee of the Standing Committee predates the acceptance of ALEPH as the national network. Now, however, it serves as a clearing-house for librarians vis-à-vis ALEPH — exchange of information, requests for changes and development, and co-ordination among libraries.

Additional sub-committees for other aspects of library management co-ordinate and exchange information on aspects of automation. In addition, ad-hoc committees are set up for formulating the requests of the libraries when a new module (such as acquisition, or serial management) is added to the system.

Challenges of An Automated Network System

Within the framework of libraries in an online automated library system, academic libraries face several challenges. ALEPH not only serves the librarians (cataloguing, circulation, etc.), but also the general public through the online access catalogue.

In Israel, the automated network of academic libraries has two major goals of equal importance: (1) to aid in the cataloguing process by making possible the easy and efficient online copying of cataloguing records from one library to another; and (2) to make catalogues of all the libraries available to all library patrons.

Plans for the near future include the creation of an online finding list that will include all of the titles in each of the libraries in one data base, together with an indication of the library that has reported the title. This network-wide index indicates to the user which library he should query in order to receive more information (i.e. fuller cataloguing, availability of copies). Today, without

this union catalogue, the user can simply guess which library might be most likely to have the title requested, and search its data base. In addition to a "catalogue" of Library of Congress MARC records, there are presently an additional 19 catalogues, representing the libraries of four academic institutions.

The catalogues of all the libraries in the ALEPH system are available to all users. ALEPH uses DECNET software to provide transparent communication. When logged into ALEPH anywhere in the network, the user can request "transfer" to the catalogue of another library. The user himself need not know which computer actually houses the requested catalogue — tables in ALEPH define that.

It is necessary to explain some of the basic design concepts of the ALEPH system in order to put into sharper focus the problems facing the library community in networking and co-operation vis-à-vis ALEPH. ALEPH is a table-driven parametric system whereby each "library" (actually, each data base owner) determines the component parts of the bibliographical record (i.e. the cataloguing), which information from this record will serve as access to these records, and what kinds of codes to use, both for the definition of the parts of the bibliographical record, and for searching the online public access catalogue.

The following examples might make these statements more concrete. One library might separate the title from the subtitle in a bibliographical record, and another might not. One library might enter titles and series in one list, and another might separate them. At an even more prosaic level, one library might code the title as TL, and another as TT. This was not always so in ALEPH. The first version of ALEPH, which ran on a mainframe Control Data Corporation computer at the Hebrew University, was a rigid system, forcing all the libraries to use the same structure for codes, data, and access files.

As previously stated, ALEPH as a network can save each library time and money by providing for copying of cataloguing information from one library to another, without the need to re-key the information. As there is overlapping of acquisitions among the academic libraries, copy cataloguing can provide cost savings. However, copy cataloguing can be cost beneficial only if the cataloguing is reasonably similar. This "similarity" or "uniformity" is required at three rather different levels: firstly, with regard to cataloguing rules, including forms of headings and common definitions for subject access; secondly, as concerns the breakdown of the bibliographical record into its component parts (fields); and thirdly, with regard to the very prosaic matter of how each of these component parts is coded (or tagged) for the computer.

Israeli university libraries have decided to adopt voluntary co-operation and common standards, without formal fining or policing. It is recognized that each library must first and foremost serve the needs of its immediate clientèle, and not some common denominator. The ALEPH programme provides for the efficient changing or adding of information when a record is copied, so that the amount of time spent in discussing, policing, and coordinating is probably greater than that which is required for tailoring.

Conformity becomes much more central and meaningful with regard to the second aspect of the automated network, the online public access catalogues available to all library patrons. The community of librarians is easily defined and static, so that once a librarian becomes familiar with the rules and practices

followed by another library, he can work with and around them. Moreover, the librarian, as a professional, is able to understand different types of catalogues. In a community so small as that of Israel, a given librarian will be familiar with the various libraries and their particular goals. The same familiarity and professionalism cannot be expected of the library clientèle.

The problems of the conformity of public access catalogues concern not only cataloguing rules but also the schemes adopted by given libraries for subject access, the schemes of "catalogues" they build, and the types of search strategies and instructions that are provided for users.

Lack of conformity in library catalogues was certainly not created by automation, and it is not automation per se that makes us more aware of the differences. It is, rather, the new world of communications, which allows a person to be situated in one place and be somewhere else at the same time; to sit at a terminal in one library, and search the catalogue of another library. Networking requires librarians to co-operate and to communicate as never before.