

**AUTOMATION IN THE HONG KONG POLYTECHNIC LIBRARY:  
A CASE OF CONTINUOUS DEVELOPMENT**

Grace Cheng  
(Former Associate Librarian, Decision Support)

Winifred Ho  
(Associate Librarian, Decision Support)

Hong Kong Polytechnic

---

The Hong Kong Polytechnic, the largest tertiary institution in Hong Kong in terms of student population, was established in 1972. The level and content of the courses offered and modes of study are continuously upgraded. Applied research and consultancies are being pursued in response to the changing technological and manpower needs of Hong Kong.

To support a dynamic and large organisation, the Library has one of the largest scientific, engineering, technology, visual arts and business collections in Asia. Over 750,000 volumes of books, 10,000 serial titles, 150,000 slides and 16,000 items of audio-visual materials and multi-media software are housed in a floor area of about 12,000 square metres. Faced with a user population of over 50,000 and 9,000 user visits per day, automation of library processes and services and the appropriate use of information technology are strategic moves.

### **The Past**

The history of automation dates back to the time when the Polytechnic Library was first established and is best summarised in three broad periods. Automation of cataloguing operations began in 1975, with the entry of cataloguing records into a central processor. After batch processing, computer printed catalogues were produced. Developments during this period included hardware upgrades, the improvement of programs, file structures and the storage of information.

The period from 1983 to 1988 was characterised by the development and use of an in-house system with cataloguing sub-system (1984), circulation sub-system (1984) and online public access catalogue (OPAC) and reserve book sub-systems (1985/86). This period marked the beginning of the integration of library automation and network access. Through the Hong Kong MARC Service, a utility shared with other tertiary institutions, MARC records were retrieved and

edited on a local network, transferred through a telephone line, and updated to the local computer in batch mode. The bibliographic database, together with staff and student records from the administrative systems, formed the backbone of the circulation and book reservation sub-systems. It was highly customised to suit local circulation policies, procedures and management requirements. The output of the library system was hard copy computer printed author/title and subject catalogues for public browsing. They were supplementary to the online public access catalogue which allowed retrieval of records from the bibliographic database through seven access points by means of "derived keys". The indexing mechanism which took the first characters of the first few words in a title, author, etc. as index keys was a state-of-the-art technique. Subsequent usage revealed the weakness of this indexing method. The occurrence of false hits was high as dissimilar headings were indexed under the same derived keys just because they started with the same characters. It was also difficult to create unique index points for discrepant subordinate corporate headings as only the first few words were indexed.

A common observation in the development of an in-house automated library system is that software maintenance and continuous development is essential to keep up with the latest technology and evolving requirements of the library, and at the same time, very costly and time-consuming. If a library cannot afford to dedicate a team of staff and the necessary resources for in-house enhancements and developments, it may be a better and quicker alternative to buy a commercial turnkey integrated library system that is known for its continuous commitment to software upgrades. The Library arrived at such a conclusion, and in 1989 acquired the Data Research System (formerly known as ATLAS), thus starting the third phase in the history of the Library's automation process. The Library chose this system largely because of its comprehensive coverage and integration of functions (for example, its user-friendly online catalogues displaying on order and circulation information in real time and its powerful keyword searching). Its compatibility with and easy migration to the existing hardware, its advanced networking capability, its adherence to standards such as MARC, ISO/OSI (International Standards Organization Open Systems Interconnection) and NISO (National Information Standards Organization), its track record of being a continuously enhanced system and its producers' expression of intent to develop the Chinese handling capability - these factors all combined to make the choice an obvious one.

Modules available include Acquisitions, Cataloging, Serials Check-in, Circulation, Reserve Book Room, Online Public Access Catalogs, Report Writer, Media Booking, Newspaper Indexing, Information and Referral and LBPH (Libraries for

the Blind and Physically Handicapped). The Cataloging Module was first implemented in September 1989, running in parallel to the in-house system. The Acquisitions Module went live in July 1990. The switch from the local system to Data Research's Circulation and Online Public Access Catalog modules took place in September 1990, after months of intensive preparations in the form of conversion of the bibliographic and patron databases, staff and user training, review and revision of procedures, and hardware upgrades. The Report Writer was implemented in December 1991, followed by the Serials Check-in module in late 1992.

Experiences in the implementation and use of systems in the past re-affirmed the basic requirements of library automation systems - standardization and the continuous development process.

The conversion of the bibliographic database from the in-house system to the Data Research system was not painless, despite the fact that the majority of cataloguing records originated from UKMARC and LCMARC databases. In the past, the records were stripped, on transfer, of basic data processing information such as the leader and directory information, indicators, subfield codes, and some data in fixed length fields, with a view to make savings on data storage and cataloguing efforts. Therefore they could not be downloaded into MARC communication format without elaborate programming and manual record editing. Had the MARC standards been strictly observed in the past, the conversion process would be much smoother.

Data Research's insistence on adhering to standards has made data sharing more than just a possibility. Enormous economies can be derived from directly transferring ready-made MARC records from all sources (eg. networked databases, CD-ROM databases). The system facilitates data transfer by various modes (online, batch, etc.). As about ninety percent of the Polytechnic collection is English-language materials, the proportion of records which can be copied from bibliographic utilities is generally high. So, even though it may take longer to create full MARC records, the work can be more than offset by the benefits derived from copy cataloguing. Database managers have many powerful features to clean up or manipulate MARC records and headings using the processing information present in standard MARC bibliographic and authority records in conjunction with sophisticated database management functions, such as Global Search and Replace, Authority Subfield Replace, MARC Field Delete, MARC Field Rename and the various downloading and loading programs.

## The Present

The support of ISO/OSI standards enables worldwide access to multiple databases via existing commercial networks such as TYMNET and INTERNET. Through DRANET, an American national bibliographic network with direct connections among library systems, libraries are able to search each other's catalogues, arrange interlibrary loans and share each other's records, thus effectively supplementing their own resources. In Hong Kong, the establishment of the Hong Kong Academic and Research Network (HARNET) has facilitated mutual access to each other's databases. Members of the academic community may also have dial-in access to all academic library catalogues and holdings. As a Charter member of the Z39.50 (a NISO standard for the exchange of data among diverse systems) Implementors' Group, Data Research is working towards transparent connections among systems, regardless of hardware, software or operating systems in use. It was announced in 1992 that such a connection with the UC Berkeley MELVYL system was successful. A MARC record can be retrieved from the server system by using the Data Research client system's commands.

The Online Public Access module is one of the programs most frequently updated by Data Research. This is a good example of continuous development by the vendor. The latest development also indicates the great potential for multiple database access: the Polytechnic Library has successfully created a most effective local journal article index. In 1992, the Hongkongiana Database, an index to periodical articles published in Hong Kong, was successfully launched and presented in the online catalogue side by side with the library catalogue.

The flexibility of the system, in conjunction with the VAX operating system utilities, enables the development of other online facilities such as electronic 'suggestions' and library bulletins. By using the VAX Mail utilities, an electronic Online Suggestions Box has been created with a view to gauging users' opinions on the use of the Library. This feature is introduced in the main 'welcome' menu of the online catalogue. The command file for suggestions provided by Data Research has been modified to prompt users for name, department, address, and telephone number before they leave the suggestion screen. This conforms with the Library's policy of not entertaining unsigned messages. Through the online suggestions facility, many comments and suggestions have been made by users about library services that would not have been made if such facilities had not existed. Although more work has been generated as a large number of messages, both valuable and irrelevant, are received every day, the Library finds the extra work worthwhile. In addition, our explanations about certain procedures and

replies to queries are added to the suggestions menu and are widely read. The online Library bulletin board gives the opening hours, key library regulations, staff directories and the latest services available. Together, they offer an effective channel of communication with our users who get to know and understand our services better and more quickly. As a whole, these new developments are well received.

### The Future

One area where Data Research has so far failed to deliver is the development of the Chinese handling capability. Even before the use of the Data Research System, the Library had put research and development efforts into a PC-based Chinese system called CIRS (Chinese/English Information Retrieval System for Libraries). We started the project in 1987 and, after the purchase of the Data Research System that had promised a Chinese handling capability, changed our development strategy. The CIRS is basically a cataloguing and online public access catalogue system. Since Data Research has been slow in delivering the Chinese handling capability, the Library intends to introduce to the public a CIRS OPAC on a stand-alone personal computer, as an interim mechanism for retrieving Chinese materials.

Imaging is a revolutionary new technology for bringing illustrations, photographs, diagrams and text to the screen for the users. The Polytechnic Library has successfully implemented, and will soon introduce to the public, a pioneering imaging application enabling users to retrieve and display more than 44,000 slides which have been transferred onto laserdisc. The project focuses on fashion, design, art and architecture and is the most advanced of its kind in Asia. The next similar project is to store the local newspaper clippings collected over 10 years in an electronic filing and retrieval system integrated into the Data Research System of the Library. Illustrations and text can be created from scanned images and OCR input. Library users will then be able to search and view newspaper clippings at the same workstation used to locate a library book.

The Library also has a plan to install CD-ROM and magnetic tape databases accessible to all users on a local area network. The users may access CD-ROM databases across a multi-user environment from their own terminals just as they would on their personal computers. Furthermore, they also have use of all the printers and other peripherals on the network. Other magnetic tapes available from vendors such as UMI/Data Courier, H.W. Wilson or Information Access can be loaded on the Library server. Library users may search bibliographic records on these databases from the same terminals using the same search strategies as they would for searching the local library OPAC. Data Research's Journal

Citation Module is able to cross-reference local serials holdings to these periodical index databases. When the user locates a citation to a journal article, the system immediately reports whether the Library subscribes to that journal. The Library has purchased the Journal Citation Module and, with the purchase of the tape databases and the live implementation of the Serials Check-in module in late 1992, the users will benefit from the efficient linking of periodical indexes and local holdings. Library users may also access the Library OPAC remotely from home, using a dial-up facility provided by the Hong Kong Polytechnic Computer Center. By this summer, a pool of 32 telephone lines will be installed to accept incoming calls for both Bell and CCITT standards.

The Hong Kong Polytechnic is in the process of connecting to the INTERNET service. INTERNET is a worldwide network interconnecting a large number of libraries, universities, research laboratories, commercial corporations, and government agencies providing a wide range of database services, bulletin boards and supercomputer facilities. By connecting to INTERNET, library users will have access to numerous sources of information all around the world.

The Library systems in the Hong Kong Polytechnic require continuous computing support and development. We truly believe that, by creatively combining innovative technology, extensive library expertise and a solid commitment to library and automation standards, the Hong Kong Polytechnic Library is heading towards providing its users with a "library without walls".

