

**THE DESIGN AND FUTURE PERSPECTIVES  
OF BIBLIOGRAPHIC DATA ON CD-ROM:  
THE EXPERIENCE OF THE NATIONAL CENTRAL LIBRARY\***

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**ABSTRACT**

The National Central Library was accomplished in developing the Chinese MARC database on CD-ROM pilot project in 1988. The products of the pilot project include Chinese bibliographic records and periodical literature index data. After finishing the system testing of the trial product, the National Central Library has positively engaged in developing two separate formal products since 1988. This article will concentrate on describing the design, functions and characteristics of the formal optical disks on Chinese bibliographic records. The future perspectives of bibliographic data on CD-ROM's technology, such as the relationship with Bibliographic Information Network, implementation of Chinese MARC, etc. are as described.

**Introduction**

The National Central Library (NCL) established the National Central Library Automated Information System (NCLAIS) in 1985. The NCLAIS is maintained by staff at the NCL and provides bibliographic products to libraries located in the Republic of China and overseas. It consists of five subsystems: acquisitions, cataloging, Chinese periodical

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literature and Chinese official gazettes index, Chinese rare books and on-line searching. The NCLAIS currently contains five types of bibliographic data, i.e., bibliographic records (Chinese and Western languages), Chinese periodical literature, Chinese official gazettes and Chinese rare books data. The records totaled more than 500,000 as of February 1991. (Figure 1)

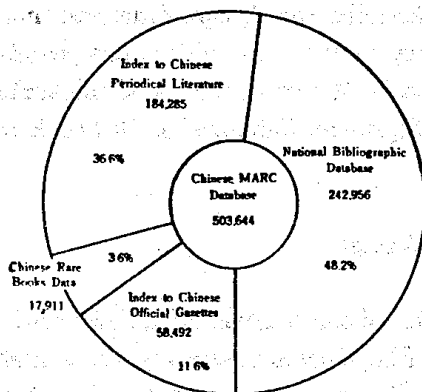


Figure 1: National Central Library Bibliographic Database. (Up to February 1991)

In the mid-1980s, the staff at the NCL became interested in the possibility of using optical disk technology to expand the utilization of NCLAIS. This technology was first successfully applied to massive data storage as well as to data retrieval in the 1980s. The NCL staff saw that optical disk technology could be applied in libraries to replace microform and books.

In 1986, the NCL began to use the CD-ROM BiblioFile system as a tool to catalog Western language materials and thereby accelerate the processing of collections. As the NCL staff found BiblioFile useful and effective, they initiated a pilot project designed to create a Chinese-language cataloging system emulating BiblioFile. The Institute of Technology Research and Industry (ITRI) was taken on as a joint partner in this venture. ITRI, located in Hsinchu, Taiwan, had developed the first domestically produced optical disk system, *Continental's Standard English-Chinese Dictionary*, in 1987.

A working group composed of representatives from both parties was established to study the formats and requirements of the joint venture's pilot project. After thirteen strenuous months, a trial product was produced by this project in October 1988 with excellent results. It contains more than 130,000 Chinese bibliographic records and periodical literature. After finishing system testing of the trial product, NCL decided to cooperate

further with ITRI to develop a formal Chinese bibliographic system on CD-ROM which would include all of the records in the NCL's MARC database. This formal product is now completed and is currently being tested by NCL staff.

This paper will describe the design, functions and characteristics of the formal Chinese bibliographic optical disk system produced by ITRI and the NCL. It will also describe the perspectives of this technology such as its relationship with the Bibliographic Information Network, implementation of Chinese MARC, etc.

### Consideration of System Design

The characteristics of the original NCL-ITRI trial product generally resembled those of BiblioFile, since inexperience and urgency in developing a Chinese-language optical disk system necessitated the adoption of BiblioFile as a model. To design the formal product, however, a task force was established to produce a proposal which more closely met NCL's requirements. In determining the design of our formal bibliographic system, we considered the characteristics of other relevant optical disk products, our own experiences in developing our local cataloging subsystem and the pilot project, and the presentation and operation of the system. The details are described as follows.

1. Characteristics of other relevant optical disk products: several bibliographic CD-ROMs became available after BiblioFile was successfully introduced to the information market. Such products include Japan MARC CD-ROM, UTLAS Discon, OCLC CD450 and BNB on CD-ROM. The most important task we faced was to study the features of each product mentioned above and determine how they related to our own requirements.
2. Experience in developing our on-line cataloging subsystem: the on-line cataloging subsystem of NCLAIS presently used was developed in cooperation with a local computer company. It was implemented in September 1989 and processed smoothly. The task force determined the functions of this system considered most helpful to users of CD-ROM and included them in the design of the new Chinese bibliographic CD-ROM.

3. Experience from the pilot project: system testing of the product produced from the pilot project showed that the trial product had many weak points which needed to be addressed. These deficiencies included the main menu of the system, inadequate number of characters, inconvenient editing process, etc. It was determined that the formal product should improve on the defects mentioned.
4. System presentation and operation: generally speaking, the system designers put emphasis on menu-driven operation, multiple access points, messages (including "help", "no match response", "error" and "waiting"), screen display formats (four types), off-line printing, editing and linked searches between classification scheme files and bibliographic records files. The main purpose of system design was to move forward to more user-friendly features, such as easy-to-learn, easy-to-use functions, flexibility, etc.

#### General Illustrations of Formal Bibliographic System

1. Hardware requirements: an IBM PC/AT or compatible microcomputer with at least one 5-1/4 inch floppy disk drive, DOS 3.1 or later, monochrome monitor and 640 RAM are necessary. A hard disk is recommended. A Chinese Character Code of Information Interchange (CCCII) interface card and a ITRI modified CD-ROM reader are also mandatory.
2. Scope: our Chinese bibliographic CD-ROM includes all Chinese MARC data created by the NCL from 1981 to 1989. The types of records number 100,000 and include books, serials, cartographic materials and microforms.
3. Functions: the formal bibliographic system has three main functions: on-line processing, batch operation and definition of parameters for display and print. They are described as follows:
  - a. On-line processing: the system is menu-driven. It uses function keys to enable users to finish most demanding cataloging routines. The function key options are displayed at the bottom of the screen. Options such as "search," "single key with multiple items," "original cataloging," "edit record," "save record," "search floppy disk record," "browse," "display," "change format display," "display previous search,"

"print" and "help." Patrons can also use other options such as "titles," "authors," "subject headings," "classification numbers/scheme," "publishers," "system identifier" and "ISBN/ISSN" as access points. The data of publication and types of the records are used as qualifiers to limit the range of search results. Boolean operators (AND/OR), truncation and browsing are also available. The system shows the results of the three previous search items. Patrons can also find out the status of a search by displaying the search percentage and hit records (see figures 2-5). There are different messages provided to inform patrons of the current status including "waiting," "error," "help" and "no match response." The selected records can be shown directly in label form and also in MARC, brief MARC and card formats (see figures 6-9). All retrieved records can be modified or added to local holdings, then downloaded to floppy disk. Records on floppy disk can also be retrieved, deleted and saved. Patrons can produce printed catalogs from the system and create card catalogs, labels and proofsheets.

- b. Batch operation: the system offers the following functions to records saved on floppy disks: the production of printed cards, proofsheets, printed catalog, brief MARC proofsheets, labels, ISO-2079 converted forms and the rebuilding of output index files. The number of print constants are defined by patrons.
  - c. Definition of parameters for display and print: the system provides five kinds of parameters for display and print: the selection of the category of printed cards, display formats, sequence of printed catalogs, items of field 805 on printed cards and note fields not printed on cards. All the parameters are subject to change in accordance with actual needs.
4. Characteristics of the system: the formal NCL-ITRI bibliographic system is not only full of multiple retrieval functions, flexible printing and editorial functions but also contains the following characteristics.

<< 中文書目光碟線上查詢 >>

\*題 名: 書法 \_\_\_\_\_

\*著 者: \_\_\_\_\_

\*撰 題: \_\_\_\_\_

\*類號 / 類目: \_\_\_\_\_

▲出版者: 藝術 \_\_\_\_\_

▲中國卡片號: \_\_\_\_\_

▲ISBN / ISSN: \_\_\_\_\_

⊕出版年: 1988 - 19    ⊕資料類型: \_ (a:圖書; s:期刊; e:地圖; h:錄影)

查詢	單鍵多項	原始編目	編改現行記錄	檢索照片記錄	取消	列印
瀏覽	儲存現行記錄	顯示記錄	顯示格式切換	以前查詢條件	HELP	結束

Figure 2: Multiple Combination Searching

\*\*\* 查詢記錄內容: 瀏覽形式 \*\*\*

序號	類 號	類 目	筆 數
0001	540	社會學總論	107
0002	540.1	社會研究法	6
0003	540.12	歷史法	0
0004	540.14	統計法	1
0005	540.15	社會調查法	2
0006	540.153	問卷	0
0007	540.16	觀察法	1
0008	540.17	實驗法	0
0009	540.19	民意測驗	2
0010	540.2	歷史法	7
0011	540.2	社會哲學	7
0012	540.21	社會正義	0
0013	540.24	各派社會哲學	3
0014	540.29	各國社會哲學	6
0015	540.64	社會學社	0

● 總筆數: 17 ●    下一頁    上一頁    檢 索    回 歸 上 查 詢

Figure 3: Classification Number Searching

<< 中文書目光碟線上查詢 >>

\*題 名: 書法 \_\_\_\_\_

\*著 者: \_\_\_\_\_

\*撰 題: \_\_\_\_\_

\*類號 / 類目: \_\_\_\_\_

▲出版者: 目前查詢進度為 67 %

▲中國卡片號: \_\_\_\_\_

▲ISBN / ISSN: \_\_\_\_\_

⊕出版年: 1988 - 19    ⊕資料類型: \_ (a:圖書; s:期刊; e:地圖; h:錄影)

Figure 4: Search Percentage Display

*** 查詢記錄內容: 條列式形式 ***						
序號	著者	書名	版次	出版地	出版者	出版年
0001	新編	會法叢書	初版	臺北市	藝術	1988
0002	閔祥德	會法百問百答	初版	臺北市	藝術	民77(1988)

● 總筆數 = 2 ● 下頁 上頁 顯示 儲存 列印 HELP 回欄覽 回線上查詢

Figure 5: Search Result Display

索書號: 942/8745  
 書名: 會法百問百答  
 著者: 閔祥德  
 版次: 初版  
 出版地: 臺北市  
 出版者: 藝術  
 出版年: 民77(1988)

NCL 88014660

Figure 6: Label Format Display

平林代號=88014660  
 行號 欄號 IND 1...5...10...5...20...5...30...5...40...5...50...5...60..

1	001	記錄性質=n	執行代碼=am2	記錄補釋=1
2	100	輸入日期=19880602	出版情況=d	
3		出版年二=1988	出版年二=d	適用對象= 政府出版品=y
4		條目記錄=0	編目語文=chi	書譯代碼=b 字集=09
5		附加字集=	題名語文=e	
6	105	新編代碼=a	內容形式=z	會議代碼=0 紀念集=0
7		索引所標=0	文學體裁=y	傳記代碼=y
8	010 0	\$b平裝\$d新臺幣120元		
9	101 0	\$achi		
10	102	\$acw		
11	200 1	\$a會法百問百答\$d閔祥德著		
12	205	\$a初版		
13	210	\$a臺北市\$c藝術\$d民77(1988)		
14	215 0	\$a10.179面\$c圖\$d19公分		
15	225 2	\$a新編會法叢書\$v5		
16	410 0	\$12001 \$a新編會法叢書\$v5		
17	606	\$2csh\$a會法		
18	681	\$a943.908\$b8474\$yv.5		
19	700 1	\$3n00R5763\$a閔祥德著		
20	801 0	\$acw\$b中國\$c19890118		
21	801 1	\$acw\$b中國\$c19890310		
22	805	\$b藝術\$c111222\$d9428e8745		

本記錄共 18 個欄位。

Figure 7: Chinese MARC Format Display

系統代號=88014660  
 行號 欄號 IND 1...5...10...5...20...5...30...5...40...5...50...5...60...  
 1 010 0 \$b平裝\$d新臺幣120元  
 2 200 1 \$a書法百問百答\$f閔祥德著  
 3 205 \$a初版  
 4 210 \$a臺北市\$c藝術\$d民77(1988)  
 5 215 0 \$a10.179面\$c圖\$d19公分  
 6 225 2 \$a新編書法叢書\$y5  
 7 606 \$2esh\$a書法  
 8 681 \$a943.908\$b8474\$yv.5  
 9 700 1 \$a閔\$b祥德\$a著  
 本記錄共 9 個欄位。

Figure 8: Brief Chinese MARC Format Display

942 閔祥德著  
 8745 書法百問百答/閔祥德著.--初版.--臺北市:藝術  
 111222美術 10.179面:圖:19公分.--(新編書法叢書:5)  
 新臺幣120元(平裝)

1.書法 I.閔祥德著 II.集叢名

NCL88014660

942 書法百問百答/閔祥德著.--初版.--臺北市:藝術  
 8745 .民77(1988)  
 111222美術 10.179面:圖:19公分.--(新編書法叢書:5)  
 新臺幣120元(平裝)

1.書法 I.閔祥德著 II.集叢名

NCL88014660

Figure 9: Card Format Display



- a. **Expansion of Chinese Characters and the Character Set Internationally Standardized:** the number of characters used in CCCII has increased from 12,000 to approximately 50,000 in order to meet the requirement of users and to facilitate Chinese information interchange.
- b. **The system is approachable and allows easy searching:** the system is menu-driven. In searching, patrons can browse the system through access points which include titles, authors, subject headings and classification numbers/scheme. On-line instructions and messages are also available. Patrons can also choose function keys to make inquiries instead of employing menu-driven operations.
- c. **The screen design is helpful:** window, a special feature of microcomputers, is widely used in the system. The system displays help text or results of last three retrieval items in windows for easy access.

### **Future Perspective of Bibliographic Database on CD-ROM**

Several issues will develop when the NCL-ITRI CD-ROM finishes testing:

1. **Promotion of Chinese MARC application:** the Chinese MARC Format was formulated, revised and tested under the Chinese Library Automation Project launched jointly by the NCL and the Library Association of China (LAC) in 1980. But the NCL has been assigned the sole responsibility of revising the Chinese MARC Format regularly from that time. The NCL has used the Format as the basis for establishing the national bibliographic database since 1981. The NCL has also held a series of training programs for the Chinese MARC Format since it was recognized as a standard format in Taiwan. Several local library systems were designed and based upon the Chinese MARC Format. With a view to further promotion of the utilization of the Format, the NCL has proposed a plan to develop MARC optical disks once the formal CD-ROM bibliographic system is issued. With such disks, local libraries will be willing to take the time and effort to establish a bibliographic database themselves.

Without the MARC standard, many of the works devoted to resource sharing and cooperation over the past few years could not have been produced.

2. Conversion of Retrospective Data: Laverna M. Saunders writes, "A CD-ROM bibliographic system can be a valuable asset to large libraries planning retrospective conversion and to smaller libraries seeking a machine-readable cataloging source."<sup>1</sup> In Taiwan, more and more libraries plan to purchase turnkey systems or develop their own systems. It is therefore necessary that the NCL accelerate the establishment of a bibliographic database. If our CD-ROM product can provide functions such as printing, downloading, editing, tape out service, etc., libraries will not be reluctant to use it as a cataloging tool. The process of downloading can eliminate manual input operation and can transfer records into a database easily with the assistance of local vendors. Therefore, it is expected that the work of retrospective conversion will be accomplished soon after the release of the formal CD-ROM system and that records will definitely link with the database.

The CD-ROM product will offer catalogers one more option in the selection of a cataloging source and an alternative to retrospective conversion of records. As Nancy Nelson writes, "CD-ROM has proved to be a valuable technology for medium-sized and smaller libraries since it has made it possible to offer automated access to local library holdings."<sup>2</sup>

3. Issues concerning license: the NCL-ITRI CD-ROM product will offer functions that include modification of the searched records, addition of local holdings and downloading to floppy or hard disk. Patrons can produce printed cards, proofsheets, labels, printed catalogs, etc. after the records are properly saved. There is no doubt that bibliographic data on CD-ROM should offer catalogers unrestricted use of MARC records. However, the process mentioned above is to some extent interfered with by issues of copyright and ownership which are defined to ensure that the intellectual property is adequately protected. Charles R. Hildreth mentions that "... more control over the distribution and use of machine-readable records will be manifest in the form of copyright claims, contracts and licensing agreements."<sup>3</sup>

In Taiwan, there are several regulations concerning optical products. Usage of optical products is limited when the purpose of the usage is profit. However, the copying of records from optical products for purposes of reference and research is not restricted. At present, therefore, it is necessary to formulate some regulations to protect such products. As Mary Kay Duggan writes, "License agreements should prevent copying of code and display, as well as of the mode of organization of the data with searchable indexes."<sup>4</sup>

4. Resource sharing: the objective of the Library Automation Project is the development of a nationwide information network. The creation of such a network is full of complexity and difficulty; thus, the NCL began the Library Automation Project by studying the relevant literature carefully and thoroughly. The NCL then proposed in 1987 an overall plan for a Bibliographic Information Network System in the Taiwan area under the guidance of the Ministry of Education and with the approval of the Executive Yuan. This plan focused on the development of a nationwide information network to take place over a three year period starting from July 1989. The major goals of the first stage of the plan are the establishment of an on-line cooperative cataloging system and an authority file and the development of an on-line bibliographic information retrieval system. In accordance with the goals of the Library Automation Project, the Bibliographic Information Center was set up under the Cataloging Department of the NCL in September 1990.

The Center is working to create a bibliographic database based on the NCL bibliographic master file. The NCL will install a total of 16 terminals in national academic libraries to test the cooperative cataloging and on-line search functions of the network system. The current NCL-ITRI CD-ROM product only covers the NCL's bibliographic records. It is hoped that as the on-line cooperative cataloging project begins to progress, the CD-ROM product will gradually include the collections of other libraries in the Taiwan area, and will thus enhance the coverage and usefulness of the Chinese bibliographic CD-ROM system. Furthermore, regular maintenance and periodic upgrades of the database are aimed at keeping the database clean and up-to-

date. Resource sharing among libraries is the only mechanism that offers real hope of improving the efficiency of a library's operations. As Charles R. Hildreth writes, "The open, almost unlimited sharing of library data--catalog records and location information--has been both the foundation and soul of library cooperation in this century."<sup>5</sup>

### **Conclusion**

The NCL-ITRI bibliographic disk system can be regarded as successful, but there are still some weak points which should be improved in the near future. These include, among other problems, the improper treatment of stopwords in the key file, the omitting of hyphen marks between subject headings and their subdivisions during browsing of subject headings, insufficient space for ISBN search, inadequate items for display and search of floppy disk records and the limitation that searched results can only be displayed one record at a time. Furthermore, the pilot project was not designed to follow the standard of ISO 9660 (1988), as this standard had not yet been announced at the time the project was established. The formal CD-ROM product was also not based on the above-mentioned standard. The NCL will move toward this direction in order to meet the standard which can operate in any kind of CD-ROM drive. Another problem involves the CCCII interface card released at the end of 1989. Its high price will be an obstacle to NCL release of the Chinese bibliographic CD-ROM system. It is hoped that these problems can be resolved in the near future. It is also important to mention that the easing of tight budgets and personnel constraints will accelerate the improvement of the next version of the Chinese bibliographic CD-ROM system.

The development of bibliographic data on CD-ROM is a real breakthrough in the history of Chinese bibliographic data processing in Taiwan, R.O.C. It has become an indispensable part of NCLAIS and will be a by-product for the development of the National Information Network. Libraries in Taiwan will be deeply affected by this cataloging tool no matter what their size.

NOTES

1. Laverna M. Saunders, "CD-ROM as a Cataloging Tool," *Technical Service Quarterly* 6 (1988): 45.
2. Nancy Melin Nelson and Desmarais Norman, "CD-ROM: an overview of US Developments," *Program* 23 (Oct. 1989): 378.
3. Charles R. Hildreth, *Library Automation in North America: a Reassessment of the Impact of New Technologies on Networking*. (Muchen: Saur, 1987), p.120.
4. Mary Kay Duggan, "Copyright and Downloading form CD-ROMs," *Database* 7 (Feb. 1988): 9.
5. Hildreth, p.118.

Additional References

- Akeroyd, John. "CD-ROM Usage and Prospects: an Overview." *Program* 23 (Oct. 1989): 367-376.
- Bibi, Abd M. "CD-ROM for Retrospective Conversion: Selection of a Source Database: the BRAZNET Experience." *CD-ROM Librarian* (Jan. 1990): 21-25.
- Chen, Miao-chin, and Liu, Chun-yin. "Application of CD-ROM Technology in the National Central Library." *National Central Library Newsletter* 20 (Feb. 1989): 49-54.
- Chou, Nancy Ou-lan. "The National Bibliographic Database and its Network Development." In *Proceedings of Library Automation and Information Networks*, Taipei, Republic of China, (1988): 107-127.
- Chou, Nancy Ou-lan, Hsiu-ying Chiang and Pi-chuan Wang Wu. "Chinese MARC Database on CD-ROM." In *Proceedings of International Information Management Congress Data and Document System Conference*, Taipei, Republic of China, (1989): 225-250.

*Encyclopedia of Library and Information Science*, vol.40, Suppl. 5, 1986. s.v.  
"Copyright, Ownership of, in Machine-Readable Bibliographic Data."

Duggan, Mary Kay. "Copyright and Downloading from CD-ROMs."  
*Database 7* (Feb. 1988): 7-9.

Hildreth, Charles R. *Library Automation in North America: a Reassessment  
of the Impact of New Technologies on Networking*. (München: Saur, 1987).

Nelson, Nancy Melin, and Desmarais, Norman. "CD-ROM: an Overview of  
US Developments." *Program 23* (Oct. 1989): 377-383.

Nissley, Meta. "Licensing Agreements: a Librarian's View." *CD-ROM  
Librarian* (Oct. 1988): 12-15.

Saunders, Laverna M. "CD-ROM as a Cataloging Tool." *Technical Service  
Quarterly 6* (1988): 45-59.

Smith, Robert, and Tony McSean. "Planning and Production the British  
National Bibliography on CD-ROM." *Program 23* (Oct. 1989): 395-413.