

MINISISE
Guide AJ/bj
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ILO図書館におけるMINISIS利用例

ILO-BIBL 6 ENGL (1987 rev.)

Guide to MINISIS in the ILO Library

INTERNATIONAL LABOUR OFFICE
Central Library and Documentation Branch

Geneva 1987

ILO. Central Library and Documentation Branch
Guide to MINISIS in the ILO Library
Geneva, 1987. 23 p. (ILO-BIBL 6 ENCL (1987))

/ILO pub/. /Guide/ to the /MINISIS/-based /information processing/
and /information retrieval/ system in the /ILO/ /Library/ - briefly
outlines MINISIS applications, key user processors, library and
system management processors, and available /data base/s.
/Illustration/s /Reference/s. ENCL 1987 10.02.7

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Contents

	<u>page</u>
1. Background	5
2. The use of MINISIS in the ILO Library	7
3. MINISIS processors	9
3.1 Key user processors	9
3.2 Processors for library management	10
3.3 System management processors	11
4. Data Bases	12
Bibliography	21
ILO Library Computer Documentation	23

A GUIDE TO MINISIS IN THE ILO LIBRARY

1. Background

In 1978, the ILO decided to substitute MINISIS for the ISIS system which it had developed and which had been in operation, in one form or another, since 1965. In 1979, a Hewlett-Packard computer was installed in ILO's Bureau of Information Systems and the MINISIS software was implemented. The main reason for the change was the cost of operating ISIS on a large IBM computer at the International Computing Centre. Several ILO-ISIS applications were operating at the ICC and it was inevitable that, as the size of these applications grew, the costs would rise as well. MINISIS was intended as a replacement system for ISIS to handle all ILO's substantive information systems. The Library application was the biggest of these and in mid-1979 the task began of converting the Library's files which had been growing since 1965. Actual conversions took place in December 1979 and MINISIS was fully operational in the Library in April 1980.

MINISIS is a generalized information-management system designed to run on the Hewlett-Packard 3000 series of computers. It was developed by the International Development Research Centre (IDRC) Ottawa, specifically to meet the need for a low-cost hardware/software package permitting on-line data entry and interactive retrieval. MINISIS gets its name from ISIS - Integrated Set of Information Systems. It performs essentially the same functions as ISIS, but does not require a large mainframe computer.

MINISIS was developed primarily for use in bibliographic information systems, but is flexible enough for many types of applications.

MINISIS combines data-base creation and management facilities and information retrieval in one package.

MINISIS is fully compatible with the widely used ISIS package.

MINISIS is "user-friendly" and easy to learn, even for people with little or no experience with computerized information systems.

MINISIS includes a set of programmes to support library management and information retrieval in small-to-medium size libraries. There are processors for entering, modifying, and retrieving data, for performing arithmetic computerations, and for producing a variety of reports. Its search processors has powerful retrieval capabilities and supports the use of an on-line thesaurus, multilingual recognition of thesaurus terms, and Boolean and arithmetic operations.

MINISIS can easily produce annotated bibliographies, library catalogues, and different types of indexes.

MINISIS can be used to prepare computer output microfiche (COM).

MINISIS has a full range of utilities to assist the data-base administrator in creating and maintaining data bases.

MINISIS facilitates the exchange of data bases by accepting and producing magnetic tapes that conform to ISO Standard 2709. It implements the ISO 7-bit character set and includes a facility for encoding French and Spanish diacritics.

MINISIS provides a complete set of application programmes. However, users with unique requirements can write specialized application programmes using the MINISIS intrinsics to supplement the generalized processors provided with the system.

In the late 1980s, IDRC is developing a new version of MINISIS that will operate on a range of mini-computers. By 1986 UNFSCO had developed a micro-computer version (Micro-ISIS) which is compatible with ISIS and MINISIS and which therefore facilitates the exchange of information between main-frame and micro-based information systems. The ILO Library has begun to provide floppy disks containing records of ILO documents and publications, on an experimental basis, to some ILO field offices.

What follows is an introduction to the use made of MINISIS in the ILO Library and in bibliographic applications elsewhere in the Office. Other documents describe the activities of the Library and the various MINISIS applications in more detail.

2. The use of MINISIS in the ILO Library

In the ILO Library, MINISIS is used for:

Ordering

producing orders, claims and cancellation notices, in English, French or Spanish, for our various book and periodical suppliers;

Cataloguing

on-line, following the guidelines of the UNISIST Reference Manual for Machine-Readable Bibliographic Description;

Retrospective Information Retrieval

by subject, date, title word, language, etc... on over 150 000 references to books, articles, reports, serials;

Selective Dissemination of Information

regular reports of relevant new items added to our various collections;

Printed Bibliographies

production of "International Labour Documentation", a monthly abstract bulletin of new items added to the Library's collection, and special subject bibliographies published in ILO's series "International Labour Bibliography";

COM Indexes

indexes on microfiche to subsets of the Library's data bases.

THESAURUS Maintenance

updating the trilingual "ILO Thesaurus: labour, employment and training terminology";

Loans

issuing and claiming books lent to ILO officials or other libraries;

Periodicals Control

monitoring the arrival and circulation of periodicals and signalling potential problems;

Information Exchange

The production of exchange tapes in ISO format for users wishing to search the LABORDOC data base on-line in their own institution (IDRC, ILO Turin Centre, League of Arab States, PADIS) or through a service bureau (ARAMIS, ESA-IRS, HRIN, ORBIT).

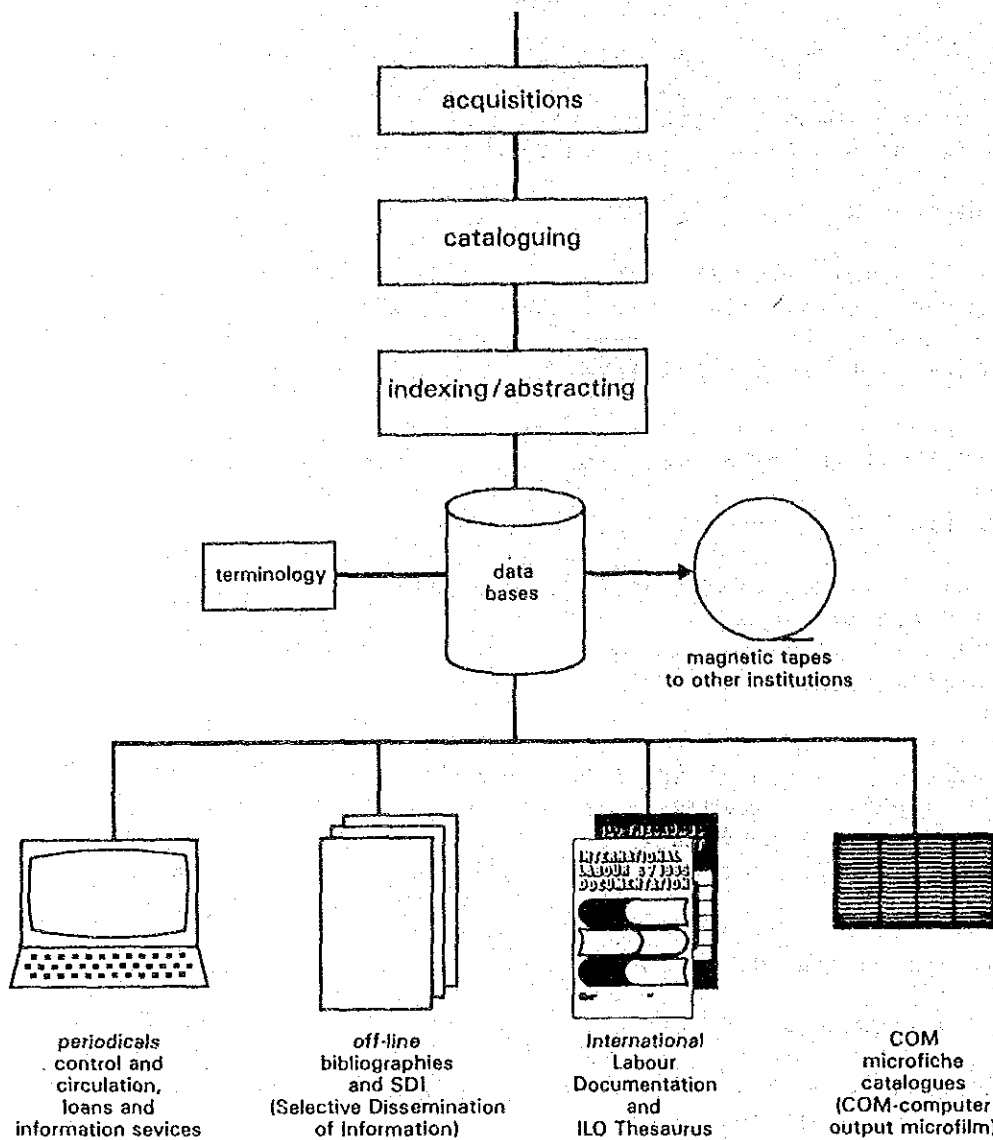


Fig. 1. Information processing at the ILO Library

MINISIS is used at every stage of processing in the ILO Library from the time that a book is ordered or a periodical or other documents received, to the time that it is available in one of the Library's data bases. Figure 1 illustrates the information flow in the ILO Library. LABORDOC is the major international data base on labour matters and the main catalogue of the ILO Library since 1965. Data is entered into the computer once only; the record that has been created is then added to or revised as more information about the item becomes available. An expanded version of LABORDOC includes records created in documentation centres in many of the ILO's technical departments. Units contributing records to LABORDOC follow the same procedures as the Library.

3. MINISIS processors

3.1 Key user processors

Every user of MINISIS has to perform a certain number of functions using MINISIS processors - the interactive programmes which enable the user to create records, manipulate data and produce output.

The user enters information into a data base which has been defined according to predetermined specifications. These specifications are translated into a data definition table (DDT) which defines the fields (or data elements) in the data base, their particular characteristics, and their relationship to each other.

The user may modify records already created by deleting or adding information.

He may search the data base to identify a subset of records to meet a specific request for information.

The facility to sort records enables him to produce a variety of indexes and lists of library material.

And he has the facility to display or print, on his terminal or on the system printer, the information that has been entered into the data base.

These five activities correspond to the five key user processors of MINISIS: ENTRY, MODIFY, QUERY, INDEX and PRINT.

ENTRY is used to create new records in a data base: MINISIS identifies for the user the most common fields in the data base and "prompts" him to supply the appropriate information; the user can then add further data elements by providing the tag or name given to the field in the data definition table. At entry, data is checked to see that it does not exceed the length of the field specified in the DDT; if the field is defined as numeric, that will be checked as well; new titles can be checked against all other titles in the data base to ensure that no duplicate records are created. The user can delete fields in the record that he is entering, list the contents of a field, or list the contents of the entire record.

MODIFY is used to make any further changes to a record once it has been entered. Records to be modified may be selected by number (the ISN or internal sequence number assigned by MINISIS) or by the value in a given field (all records with author Johnson, for example). Once records have been selected, the user may add, delete or replace fields or change the data in a field.

The **QUERY** processor handles information retrieval. There are two basic and complementary approaches to retrieval. The system can search in indexes that it has already created for fields flagged as fields for inversion in the data definition table; or it can read each record sequentially looking for a specified value. The first approach is faster to execute than the second and is therefore usually the first tactic in a subject search. This inverted file approach can be

supplemented by a text search to further refine the result. The core QUERY commands which can be used in both inverted file and text searches, are the standard Boolean operators "AND", "OR", "EXCLUSIVE OR", "AND NOT". Each operation produces a list of the record numbers which correspond to the specification; this list can then be combined with other lists until all requirements have been met. QUERY can also be used to select records where fields are absent or present and to select records with numerical values greater than, less than or equal to a given value.

All sorting operations in MNISIS are handled by the INDEX processor; it allows up to five keys (fields or data within fields) to be extracted from records and to be sorted in ascending or descending alphabetic or numerical sequence.

Several special sort options are available, for example, to handle UDC codes. INDEX copies the sorted data to an output file and matches it with records in the data base from which the original information was extracted.

PRINT controls the display of all records at the terminal or on the system printer. It allows the user to select fields from a record and specify their arrangement on a terminal screen, printed page or microfiche. Output may be presented in tabular or sequential form and may be designed for preprinted forms. To create new print formats or to modify existing ones, the user needs to know the tags or names of the fields he intends to display and to be able to respond to questions posed to him by the PRINT processor about their positioning on the page.

These five processors are the core of the user processors in MNISIS and they are explained in more detail in separate manuals. The processors do not work in isolation; output can be passed among them to be sorted, printed or displayed as required.

All these processors are designed to be used interactively through a dialogue between MNISIS and the user. Most can also be used in batch mode; and both the processors and output created through them can be combined into jobs which are initiated by the computer according to the priority that has been assigned to them.

In addition to these five processors there are others that are useful for library management and still others that are necessary for system management.

3.2 Processors for library management

The RELEASE/DELETE processor is used to delete records from the data base.

The COMPUTE processor allows the user to perform arithmetic operations on numeric fields in the data base - either within a single record or across all records in the data base or in a subset of it.

This is particularly useful for maintaining statistics of library activities and for accounting for expenditure.

LISTFORMAT lists all the print formats available to a user; LISTDOT lists data definition tables and gives the specifications for each field.

3.3 System management processors

The System manager needs a set of processors to enable him to define data bases and their interrelationships, allocate space and perform maintenance operations on the various files.

DATADEF controls data definition tables and security profiles; GARBAGE scans data bases for unused space and creates a new version in the most compact form possible; INVERT generates and maintains inverted files; THLOADER loads the multilingual thesaurus.

ISOCNV facilitates the production of a copy of the data base, a subset of it, or a subset of fields in a record, in the exchange format defined by the International Standards Organization (ISO 2709).

Figure 2 depicts the MINISIS processors employed by the system manager in the Computer Department and the users in the various departments.

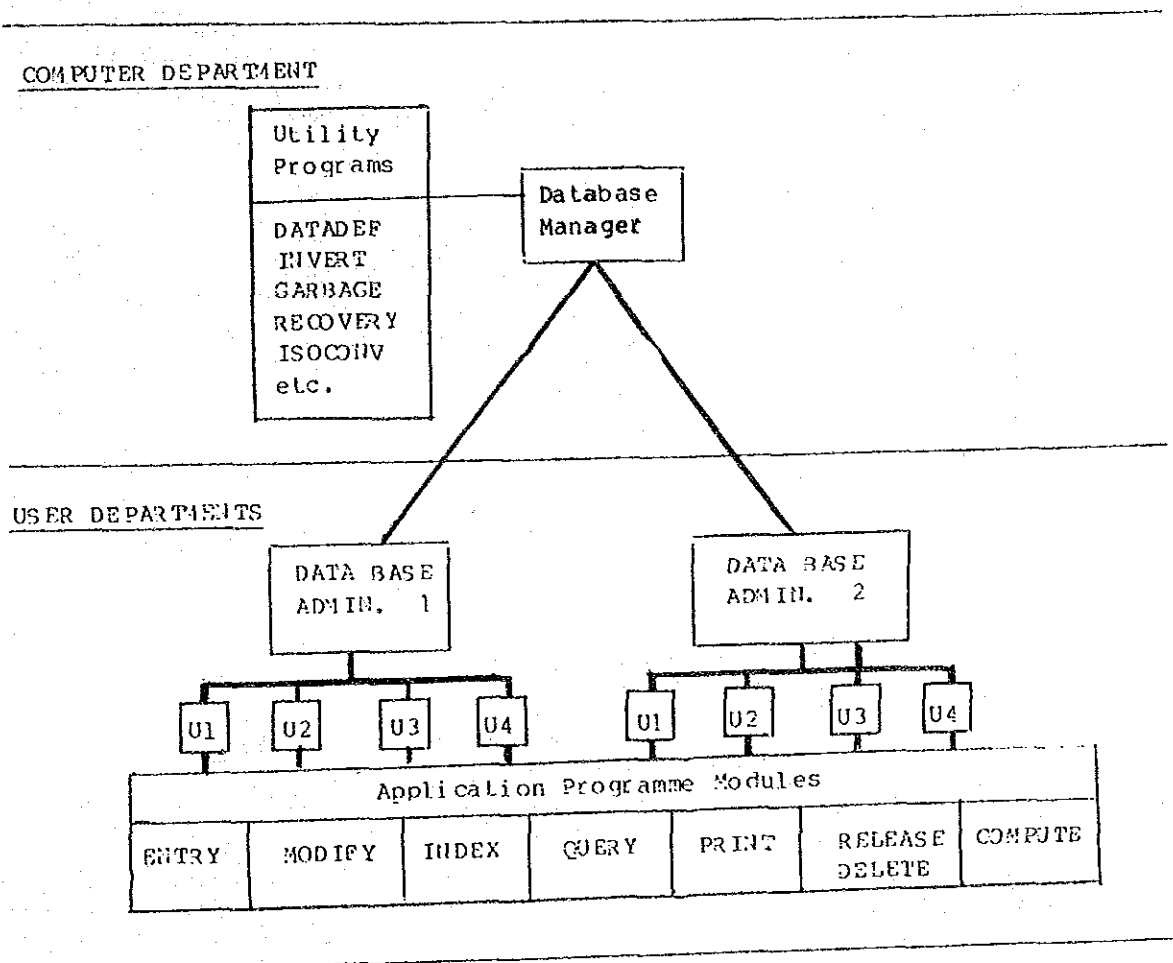


Fig. 2. MINISIS processors

4. DATA BASES

Data bases, as we have seen, are defined by data definition tables which identify all the elements of information needed to describe a particular kind of entity. In the ILO Library, we consider books, reports, documents and journal articles to be one kind of entity requiring one definition; records representing all these items are to be found in one data base (either PROCESS or LABORDOC, depending on whether the record is complete or not; see fig. 3). Periodicals are treated as a different kind of entity and are recorded in the SERIALS data base.

DB PROCAT

BIBLEV: M
ISN: 176493
TITLE: GUIDE TO MINISIS IN THE ILO LIBRARY.
CORPNM: ILO. CENTRAL LIBRARY AND DOCUMENTATION BRANCH
COLLAM: 11 P.
PLACE: GENEVA,
CNTRY: IGO
DATEC: 1984
DATEI: 1984.
LANTEX: ENGL
STATUS: BIBLIO
STDATE: 12/08/86
COLSO: U
CALLNO: 84B09/657 ENGL
RRN: 176531 SPAN
DESCRE: /ILO pub/. /Guide/ to the /MINISIS/-based /information processing/ and /information retrieval/ system in the /ILO/ /Library/ - briefly outlines MINISIS applications, key user processors, library and system management processors and available /data base/s. /Reference/s.
FACET: 19.02.7
ILOIND: I
ILOTYP: P
B050: 19.02.2
RENUM: 0895
RENUMC:

DB LABORDOC

176493 CALL NO.: 84B09/657 ENGL
ILO. CENTRAL LIBRARY AND DOCUMENTATION BRANCH
--- GUIDE TO MINISIS IN THE ILO LIBRARY.
GENEVA, 1984. 11 P.
/ILO pub/. /Guide/ to the /MINISIS/-based /information processing/ and /information retrieval/ system in the /ILO/ /Library/ - briefly outlines MINISIS applications, key user processors, library and system management processors and available /data base/s. /Reference/s.
ENGL
1984 19.02.7
TRANSLATION: 176531 SPAN

Fig. 3 A record as seen through PROCAT and LABORDOC

MINISIS provides several ways of looking at a data base:

- it may be viewed exactly as it is defined by its DDT, in its entirety;
- a selection of fields (a "view" of the DDT) may be looked at; or
- it may be looked at in conjunction with another data base to which it is "joined".

These different ways of looking at data bases correspond to the organization of information about books on order, and other documents being processed in the ILO Library; see Fig. 4.

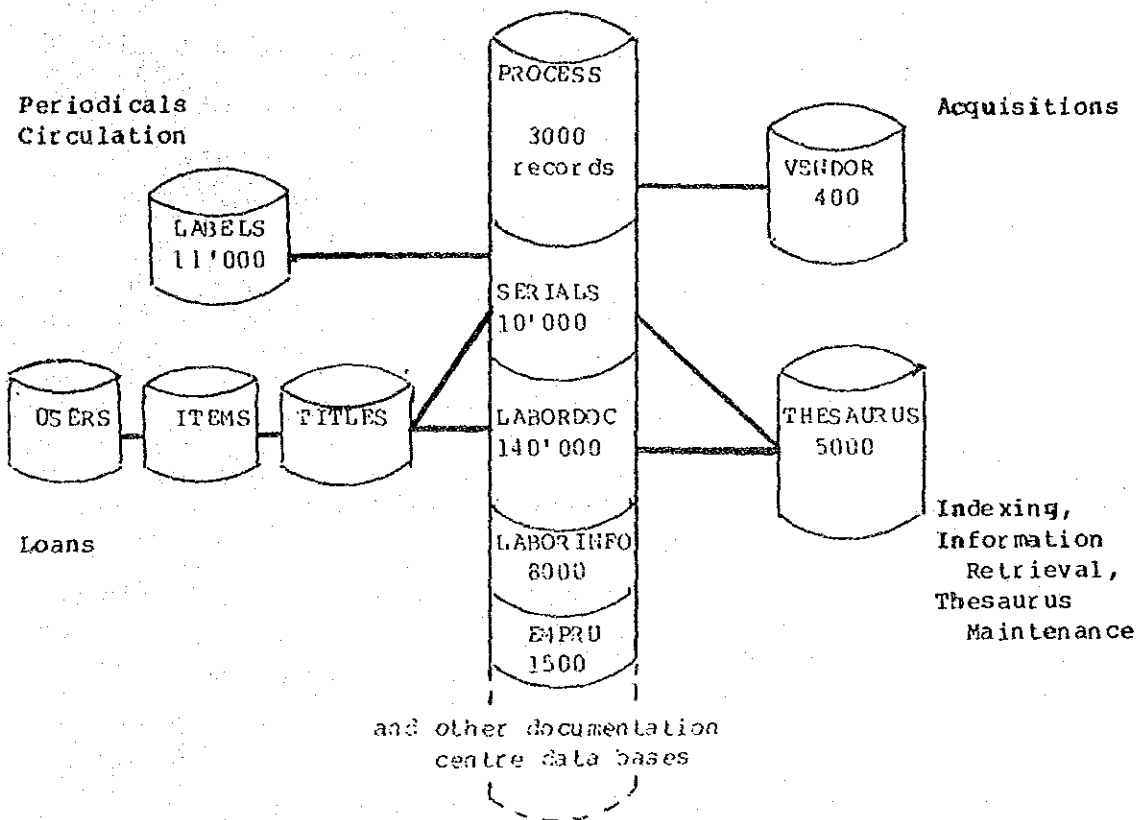


Fig. 4 Different views of the main data bases

The basic data base containing information about books on order is called PROCESS. There are different views of this data base to facilitate acquisitions processing (PROACQ), the addition of cataloguing information (PROCAT) and the processing of international organization documents (PROILO). Each of these views encompasses only the fields in the DDT which are relevant to the particular job in hand. In addition, to produce orders for books it is necessary to combine information about the books with information about the book supplier, thus we have the data base PROCVS which enables us to take information from both the PROCESS and the VENDOR files.

PROCESS is the data base looked at in its entirety. PROACC, PROCAT and PROILO are views of the PROCESS file. PROCESSV is a joined view taking selected fields from the PROCESS and the VENDOR files.

In addition, data bases perform different functions as far as the Library is concerned. Some are designed to provide service to users, some facilitate library housekeeping, and some combine both functions.

The LABORDOC data base, which represents the major items added to the collection of the ILO Library since 1965 (some 140,000 items by the end of 1987) is the main view from which information is retrieved for Library clients. Records only become part of LABORDOC when they are complete and correct; they remain in LABORDOC until the items they represent have outlined their usefulness, at which time, the records are deleted (figure 4).

The PROCESS view includes records from the time items are ordered until cataloguing information and abstracts have been added and printed in the latest issue of the monthly bulletin International Labour Documentation. PROCESS is essentially a housekeeping file but it is also used to produce microfiche indexes which keep ILO staff informed of material on order.

ILODOC is the view that contains only records of documents and publications produced by the ILO.

The VENDOR file is a housekeeping file of the names and addresses of suppliers; it is joined to the PROCESS and SERIALS files to produce correctly addressed orders, claims and cancellations.

The ITEMS file records information about documents borrowed (and the title of the item if it belongs to another library or the collection that predates 1965 for which there are no records in LABORDOC). USERS contains information about individual borrowers and libraries from which we borrow through interlibrary loan.

The SERIALS data base contains data about the serials holdings of the Library; information about the receipt of current issues is kept in the RFGIN file used in the CARDEX processor, a special journal registration module (figure 5).

```
NUMERO: 94294          FORMULE: V/N,4          FREQUENCE: 4  COPIE(S): 1
-----
COTE:    P91391          ISSN:
TITRE:   FIPA NOUVELLES : AGRICULTURE DANS LE MONDE.
SOURCE:  FEDERATION INTERNATIONALE DES PRODUCTEURS AGRICOLES. PARIS.
FREQ: QU CONS: 0  LANG: FREN
LANGREF: 91390 91391
-----
LES DERNIERS INSCRITS:
    45/1  86          45/2          <22/07/86>
    45/3          <03/11/86>          45/4          <03/02/87>
    46/1  87          <24/04/87>          46/2  A          0/1
    46/3          <17/11/87>
LE PROCHAIN NUMERO A INSCRIRE SERA LE: 46/4 - FAUT-IL L'INSCRIRE (0=OUI)?
```

Fig. 5 Serials registration (CARDEX)

The LABEL file contains information about the circulation lists for individual serials titles. Joined with the SERIALS file, LABELS can produce circulation lists to control the routing of serials issues, and lists of the titles that are directed to individual users or departments (figure 6).

THESMAS is the data base which contains the terminology in English, French and Spanish with an indication of the structure and of the links among descriptors. Descriptors are used to characterize the subjects of items in the collection. THESMAS can be used during retrieval to identify potential search terms. It is also the basis of the printed version entitled ILO Thesaurus: labour, employment and training terminology (figure 7).

Bibliothèque du BIT, CH-1211 Genève 22 NOV 23, 1987

P44051/1
ASLIB, LONDON. - ASLIB INFORMATION.

Please indicate date passed on / Indiquer la date de transmission

WILD K. (BIBL)
STODDART L. (BIBL)
LUZY S. (BIBL/SEL)
JESSE A. (BIBL)
CANADAS L. (BIBL)
PELLIER A. (BIBL)
DRYDEN L. (BIBL)
KETTAF K. (BIBL)
CORNEJO RIOS R. (BIBL/ACQ)
SALLE DE LECTURE

Fig. 6 Circulation label

Fig. 7 ILO Thesaurus (photocomposition).

ALPHABETICAL INDEX

WAGE
WAGE 2757 (13.07)
WAGE ATTACHMENT 2758 (13.07)

INDEX ALPHABETIQUE

SALAIRE
SAISIE DE SALAIRE 2758 (13.07)
SALAIRE 2757 (13.07)

INDICE ALFABETICO

SALARIO
EMBARGO DEL SALARIO 2758 (13.07)
SALARIO 2757 (13.07)

SYSTEMATIC DISPLAY - PRESENTATION SYSTEMATIQUE - PRESENTACION SISTEMATICA			
13.07	WAGES AND WAGE PAYMENT SYSTEMS	SALAIRES ET SYSTEMES DE REMUNERATION	SALARIOS Y SISTEMAS DE REMUNERACION
<p>2757</p>	<p>WAGE Payment made for work performed.</p> <p>UF REMUNERATION SALARY BT INCOME NT FEE TIPPING WAGE CUT WAGE INCREASE RT WAGE ATTACHMENT WAGE COUNCIL WAGE DEDUCTION</p> <p>2758 * WAGE ATTACHMENT 1984 RT WAGE</p>	<p>SALAIRE Remuneration perçue au titre du travail effectué.</p> <p>UF REMUNERATION TRAITEMENT BT REVENU NT HONORAIRES GRATIFICATION BAISSE DE SALAIRE AUGMENTATION DE SALAIRE RT SAISIE DE SALAIRE CONSEIL DE SALAIRE PRELEVEMENTS SUR LE SALAIRE</p> <p>SAISIE DE SALAIRE 1984 RT SALAIRE</p>	<p>SALARIO Remuneración recibida por el trabajo efectuado.</p> <p>UF REMUNERACION SUELDO BT INGRESO NT HONORARIOS GRATIFICACION DISMINUCION SALARIAL AUMENTO SALARIAL RT EMBARGO DEL SALARIO CONSEJO DE SALARIOS DEDUCCIONES DEL SALARIO</p> <p>EMBARGO DEL SALARIO 1984 RT SALARIO</p>

These are the main files or data bases in use in the ILO Library. More detailed information about their creation and use can be found in the applications manuals which describe each stage of processing in the Library (see Bibliography and ILO Library Computer Documentation).

Figure 8 gives examples of an Order Letter and a Loans Recall Notice.

Figure 9 shows sample pages of a Bibliography produced from the LABORDOC data base using a laser printer.

Figure 10 displays one of the numerous searches processed day-by-day.

ILU Library
1211 Geneva 22
40550124

DITTELLE, Centre de Recherche
de Genere
Bibliothèque
7, ROUTE DE BAYLE
1227 CAROUGE-GLAREZ

RECALL NOTICE (A-622) OCT 29, 1987

The loan period for the following item(s) borrowed on the 1987-09-09 has expired. PLEASE RETURN together with this FORM, or if you wish to renew any of them for a further two weeks, tick the appropriate box. Thank you

ILO Library, Reading Room
International Labour Office
CH-1211 GENEVA 22
Switzerland

Callno: 76009/1077 Copy: 4 0014770
Author: JO SH
Title: IMPACT OF MULTINATIONAL FIRMS ON EMPLOYMENT AND INCOMES: THE CASE OF SOUTH KOREA.
[] Please renew

Callno: 83809/696 ENGL Copy: 1 0014771
Author: MICHELL T
Title: REPUBLIC OF KOREA: EMPLOYMENT, INDUSTRIALIZATION AND TRADE.
[] Please renew

Callno: 83809/373 ENGL Copy: 5 0014772
Author: DOER R TAZA K
Title: FLEXIBLE RIGIDITIES: INDUSTRIAL POLICY AND STRUCTURAL ADJUSTMENT IN THE JAPANESE ECONOMY, 1970-80.
[] Please renew

PURCHASE ORDER

FROM: ACQUISITIONS SECTION, BIBL.
INTERNATIONAL LABOUR OFFICE
CH-1211 GENEVA 22 (SWITZERLAND)

TO: RESIDENT REPRESENTATIVE OF THE UNDP
IN CENTRAL AMERICA
P.O. BOX 1114
SAN SALVADOR
EL SALVADOR

Please obtain for us the following publication:

ORDER NO.: BIBL/194845 (Please quote in all correspondence)
Date: 07/09/87

Author(s): EL SALVADOR. DIRECCION GENERAL DE ESTADISTICA Y CENSOS

Title: CENSOS ECONOMICOS, 1979.

Source: SAN SALVADOR, 1981.

No. of copies: 1 Send by: POUCH
Unit price: (EST) 0

budgetary code: A.120.20.499.999.5301.06159

Instructions: Please bill us for payment in TRIPLICATE if there is any charge and send carriage paid to:

ACQUISITIONS SECTION, BIBL.
INTERNATIONAL LABOUR OFFICE
CH-1211 GENEVA 22 (SWITZERLAND)

Please return one copy of this slip with the publication.

If the publication is unavailable, please INFORM US without delay.

Signature of authorized contracting official: Date: 07/09/87

Fig. 8 a) Order letter b) loans recall notice

<p>3</p> <p>List of subjects</p> <p>The headings used in the bibliography are those printed in bold type.</p> <p>ABSENCE LEAVE OF ABSENCE ACCOUNTING COST ACCOUNTING AND PROFIT ADMINISTRATION LABOUR ADMINISTRATION AGRARIAN <i>see also</i> RURAL AGRARIAN STRUCTURE AGRICULTURAL ECONOMICS AGRICULTURAL ENTERPRISE AGRICULTURAL POLICY AGRICULTURAL RESEARCH AGRICULTURAL FORESTRY <i>see also</i> RURAL</p>	<p>212</p> <p>ILO publications and documents</p> <p>LEAVE OF ABSENCE</p>	<p>1157 STATISTICS OF PAID VACATIONS. ILO; ILO INTERNATIONAL CONFERENCE OF LABOUR STATISTICIANS, 13TH, GENEVA, 1982. GENEVA, 1982. 6 P. (ILO-ICLS/13/VI) (REPORT VI.) (ALSO HELD IN MICROFICHE) ISBN: 92-2-102952-2; ILO Library: 82809/442 ENGL FREN GERH RUSS SPAN</p> <p><i>See also:</i></p> <p>MATERNITY BENEFITS IN THE EIGHTIES; AN ILO GLOBAL SURVEY (1964-84). 0156</p> <p>MACHINE-TOOL INDUSTRY</p>	<p>1157 ERGONOMIC PRINCIPLES IN THE DESIGN OF HARD TOOLS FRASER TM; ILO; GENEVA, 1980. VII, 93 P. (OCCUPATIONAL SAFETY AND HEALTH SERIES, NO. 44.) (Sw.fts. 15.00) ISBN: 92-2-102956-7; ILO Library: 80809/537 ENGL</p> <p>1154 GUIDE TO TOOLS AND EQUIPMENT FOR LABOUR-BASED ROAD CONSTRUCTION. ILO; GENEVA, 1981. 1 V. (Sw.fts. 60.00) ISBN: 92-2-102539-X; ILO Library: 81809/1 ENGL</p> <p>1155 MARKET STRUCTURE, INDUSTRIAL ORGANISATION AND DEVELOPMENT: THE CASE OF THE JAPANESE AUTOMOBILE INDUSTRY</p>
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<p>Author index</p> <p>445</p> <p>ABATE A 2322 0011 ANHOS M 1541 ABDEL-FADIL M 1661 0881 AHMAD N 2103 0648 ABDELJELIL B 1795 ABUJILAN 2672 175 ABUJILAN</p>	<p>Corporate author index</p> <p>476</p> <p>SEYCHELLES. DEPARTMENT OF AGRICULTURE AND LAND USE 0233 SUMMARY ON THE ILO TECHNICAL ASSISTANCE PROGRAMME. SIERRA LEONE EMPLOYERS' FEDERATION 1084 INDUSTRIAL RELATIONS WORKSHOP, FREETOWN, SIERRA LEONE, NOVEMBER 6-9... SIERRA LEONE INSTITUTE OF MANAGEMENT 1084 INDUSTRIAL RELATIONS WORKSHOP, FREETOWN, SIERRA LEONE, NOVEMBER 6-9... SIERRA LEONE. DEPARTMENT OF COOPERATIVES 0470 REPORT ON NATIONAL SEMINAR ON COOPERATIVE TRAINING AND FINANCIAL MA... SIERRA LEONE. MINISTRY OF DEVELOPMENT AND ECONOMIC PLANNING. CENTRAL PLANNING UNIT 0722 NATIONAL SEMINAR ON POPULATION, EMPLOYMENT AND DEVELOPMENT PLANNING...</p>	<p>Country and area index</p> <p>486</p> <p>AFRICA <cont'd> 1707 PROBLEM OF POST-PROJECT MAINTENANCE IN SPECIAL PUBLIC WORKS PROGRAM... 0965 PROMOTION OF EFFECTIVE LABOUR INSPECTION IN AFRICA. 0408 PROSPECTS FOR AFRICA ARE ALARMING (SYMPOSIUM ON CO-OPERATION BETWEEN... 1961 RAINMAKER: A LIGHT-HEARTED ACCOUNT OF THE TRIALS THAT BESET A SMALL... 0775 RATIFICATION AND IMPLEMENTATION OF INTERNATIONAL LABOUR STANDARDS I... 0409 REGIONAL MEETING OF AFRICAN INSTITUTES OF RESEARCH IN SOCIAL SCIENC... 1962 REGIONAL SEMINAR ON DEVELOPMENT OF SMALL-SCALE CONSTRUCTION ENTERPR... ...AFRICAINS DE RECHERCHE SOCIALE ET HISE EN... ...SION</p>	<p>Title index</p> <p>614</p> <p>0791 WORLD EMPLOYMENT PROGRAMME RESEARCH IN THE 1980S. 0383 WORLD EMPLOYMENT PROGRAMME, NINTH PROGRESS REPORT ON INCOME DISTRIBUTION AND EMPLOYMENT. 0384 WORLD EMPLOYMENT PROGRAMME: EIGHTH PROGRESS REPORT ON INCOME DISTRIBUTION AND EMPLOYMENT. 0929 WORLD EMPLOYMENT PROGRAMME: FIRST PROGRESS REPORT ON THE INTERNATIONAL DIVISION OF LABOUR. 0582 WORLD EMPLOYMENT PROGRAMME: WHAT IT IS, WHAT IT DOES. 1144 WORLD LABOUR REPORT. ...AND THE PROTECTION... ...AS THE</p>
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Fig. 2 Subject guide to ILO Publications (laser printer)

INTERNATIONAL LABOUR OFFICE
EMPLOYMENT IMPLICATIONS OF TECHNOLOGICAL CHANGE, FAR EAST
LABORDOC REFERENCES, 1983-

DR J.-SMITH, LONDON UNIVERSITY

SEARCH QUESTION: (2)
ANY EMPLOYMENT AND ANY TECHNOLOGICAL CHANGE AND NT FAR EAST
1: P=18 T=16

AND DATEC > 1982*
2: P=10 T=10
AND NOT RESTRICTED
3: P=10 T=10

OR ISN 1
2: P=11 T=11

STU/UK

(3)

- EMPLOYMENT P-5137
- AGRICULTURAL EMPLOYMENT P-168
- CLANDESTINE EMPLOYMENT P-61
- COMPETITIVE EMPLOYMENT P-10
- DESIGNATED EMPLOYMENT P-1
- EMPLOYMENT P-5137
- EMPLOYMENT CREATION P-1257
- EMPLOYMENT OPPORTUNITY P-1527
- EMPLOYMENT POLICY P-2146
- EMPLOYMENT QUOTA P-12
- EMPLOYMENT SECURITY P-369
- FULL EMPLOYMENT P-224
- INCOME GENERATING ACTIVITIES P-136
- MOONLIGHTING P-33
- NONFARM EMPLOYMENT P-70
- PART TIME EMPLOYMENT P-270
- RURAL EMPLOYMENT P-264
- SHELTERED EMPLOYMENT P-37
- TEMPORARY EMPLOYMENT P-207
- UNPAID WORK P-75
- WORK SHARING P-57
- YOUTH EMPLOYMENT P-109
- TECHNOLOGICAL CHANGE P-2893
- AUTOMATIC CONTROL P-44
- AUTOMATION P-790
- BIOTECHNOLOGY P-37
- COMPUTER-AIDED DESIGN P-24
- COMPUTER-AIDED MANUFACTURING P-42
- COMPUTERIZATION P-463
- ELECTRONIC MESSAGING P-6
- INDUSTRIAL ROBOT P-127
- MECHANIZATION P-31
- MICROCOMPUTER P-60
- MICROELECTRONICS P-304
- MICROPROCESSOR P-62
- NUMERICAL CONTROL P-15
- TECHNOLOGICAL CHANGE P-2893
- TELECONFERENCING P-1
- TELEMATICS P-44
- VIDEOTEK P-23
- WORD PROCESSING P-59
- FAR EAST P-163
- CHINA P-1528
- HONG KONG P-370
- JAPAN P-2338
- KOREA P-29
- KOREA DPR P-62
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- MACAU P-11
- MONGOLIA P-72
- 1: P-34 T-11

(3)

(2)

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NOV 27, 1987

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/Employment security, /microelectronics/ /technological change, /Japan/.
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--- The ILO can supply only its own documents and publications which are indicated in this bibliography by "ILO pub" or "ISSA pub". Other material should be ordered from booksellers of the issuing agency, or borrowed from a library.

Fig. 10 Retrospective information retrieval

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that proper record-keeping is essential for transparency and accountability, particularly in financial reporting and compliance with regulatory requirements. The text notes that incomplete or inconsistent records can lead to misunderstandings, disputes, and potential legal consequences.

2. The second part of the document outlines the various methods and tools used to collect and analyze data. It highlights the need for standardized procedures to ensure the reliability and validity of the information gathered. The document also discusses the challenges associated with data collection, such as incomplete data, measurement errors, and the potential for bias. It suggests that using multiple data sources and employing rigorous statistical techniques can help mitigate these issues.

3. The third part of the document focuses on the analysis and interpretation of the collected data. It stresses the importance of understanding the context and limitations of the data before drawing any conclusions. The text describes various analytical techniques, including descriptive statistics, inferential statistics, and regression analysis, and provides examples of how these methods can be applied to real-world data sets. It also discusses the role of visualization in presenting the results of the analysis in a clear and concise manner.

4. The fourth part of the document discusses the ethical considerations surrounding data collection and analysis. It emphasizes the need to protect the privacy and confidentiality of the data, particularly when dealing with sensitive information. The text outlines the principles of informed consent, data minimization, and data security, and provides guidance on how to implement these principles in practice. It also discusses the potential for data misuse and the importance of establishing clear policies and procedures to prevent such incidents.

5. The fifth part of the document discusses the future of data collection and analysis. It highlights the rapid pace of technological change and the increasing reliance on data-driven decision-making. The text discusses emerging technologies, such as artificial intelligence, machine learning, and big data, and their potential to revolutionize the way we collect and analyze data. It also discusses the challenges associated with these technologies, such as data quality, privacy, and the potential for bias and discrimination. The document concludes by emphasizing the need for continued research and innovation in this field to ensure that data collection and analysis remain effective and ethical tools for understanding the world.

Bibliography

Below is a selection of general references dealing with MINISIS. For more specific bibliographies, a distinct LABORDOC search is recommended. The annual proceedings of the MINISIS user group (MUG) contain technical papers on further development and applications of MINISIS. A list of ILO Library Manuals is given at the end.

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GENEVA, 1986. 37 P. (ILO-BIBL 2 ENGL (1986))
/ILO pub/. /MINISIS/ /manual/ providing a /guide/ to /information
retrieval/ using /labour/ related /data base/s available in the /ILO/
/Library/ - describes (1) LABORDOC (computerized Library catalogue
since 1965), its extension to ALLDOC (LABORDOC together with
specialised departmental data bases), (2) the PROCESS data base
(material on order, being catalogued or abstracted), (3) SERIALS
(periodicals held in the Library), (4) LABNOR (ILO Conventions and
their ratification status), and SERLEG (labour and social security
legislation); presents detailed search /methodology/ and examples.
Language of text: ENGL

ILO. CENTRAL LIBRARY AND DOCUMENTATION BRANCH
LABORDOC CATALOGUING MANUAL.
GENEVA, 1986. IV, 135 P. (ILO-BIBL 1 ENGL (1986))
/ILO pub/. /MINISIS/ /cataloguing/ /manual/ for /ILO/'s LABORDOC /data
base/ - describes contents of fields, editorial practice and
idiosyncrasies relating to descriptive cataloguing, subject indexing,
and /acquisitions/; gives instructions for the processing of corporate
authors, titles and series, choice of bibliographic level, and links
with the ILO Thesaurus; includes a /table/ of country codes based on
/ISO/ /standard/ 3166.
Language of text: ENGL

ILO. CINTERFOR

GUIA DEL MINISIS EN LA BIBLIOTECA DE LA OIT.

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/ILO pub./ /Guide/ to the /MINISIS/-based /information processing/ and /information retrieval/ system in the /ILO/ /Library/ - briefly outlines MINISIS applications, key user processors, library and system management processors and available /data base/s. /Reference/s.

Language of text: SPAN

Also available in: ENGL

INTERNATIONAL DEVELOPMENT RESEARCH CENTRE, OTTAWA

ILO. CINTERFOR

INTRODUCCION AL MINISIS.

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/ILO pub./-/CINTERFOR pub./ /Article/ introducing the /MINISIS/ /library automation/ system - stresses advantages of mini-/computer/s and flexible /data base/s facilitating /information retrieval/; explains /terminology/, /information service/ provided and installation requirements.

Language of text: SPAN

SLY M

INTERNATIONAL DEVELOPMENT RESEARCH CENTRE, OTTAWA

PLANNING FOR LIBRARY AUTOMATION USING MINISIS.

OTTAWA, 1981. 14 P.

/Planning/ /guide/ for /library automation/ - addresses the basic questions of system study prior to decision, and, using /MINISIS/ as an example, the specific points to be considered when implementing an automation project. /Reference/s.

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GENEVE, PRIV. PRINT, 1982. 1 V.

/Thesis/ presenting a detailed description of the use of /MINISIS/ for /library automation/ at the /ILO//library/ - traces developments since 1980, /technical aspect/s of MINISIS, applications in /acquisitions/, /cataloguing/, /indexing/ and /information retrieval/ in the Central Library and Documentation Branch as well as elsewhere in the ILO (e.g. /CIS/, DOSCOM, LABNOR, SESAME and QUALIS /data base/s, and the /ILIS/ project), and includes an overall /evaluation/ of the system. /Bibliography/ p. 88, /diagram/s, /illustration/s and Data Definition /Table/s (DDT).

Language of text: FREN

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Language of text: ENGL

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2	ENGL (1986)	Guide to searching data bases Available in the ILO Library
3	ENGL (1986)	ILO Manual for Area Office Libraries
	FREN (1986)	Manuel pour les bibliothèques des bureaux locaux
	SPAN (1987)	Manual para las oficinas de área de la OIT
4	ENGL (1987)	Bibliographic Field Descriptions Manual for MICRO-ISIS Users
5	ENGL (1988)	Micro-ISIS users guide: (in preparation) Bibliographic data bases
	FREN (1988)	Guide de l'utilisateur de (in preparation) Micro-ISIS: Bases de données
	SPAN (1988)	Guía del usuario de Micro-ISIS: Bases de datos bibliográficos (in preparation)
6	ENGL (1987)	Guide to MINISIS in the ILO Library
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9	ENGL (1987)	LABORDOC Document Analysis Manual

ILO's computerised information services

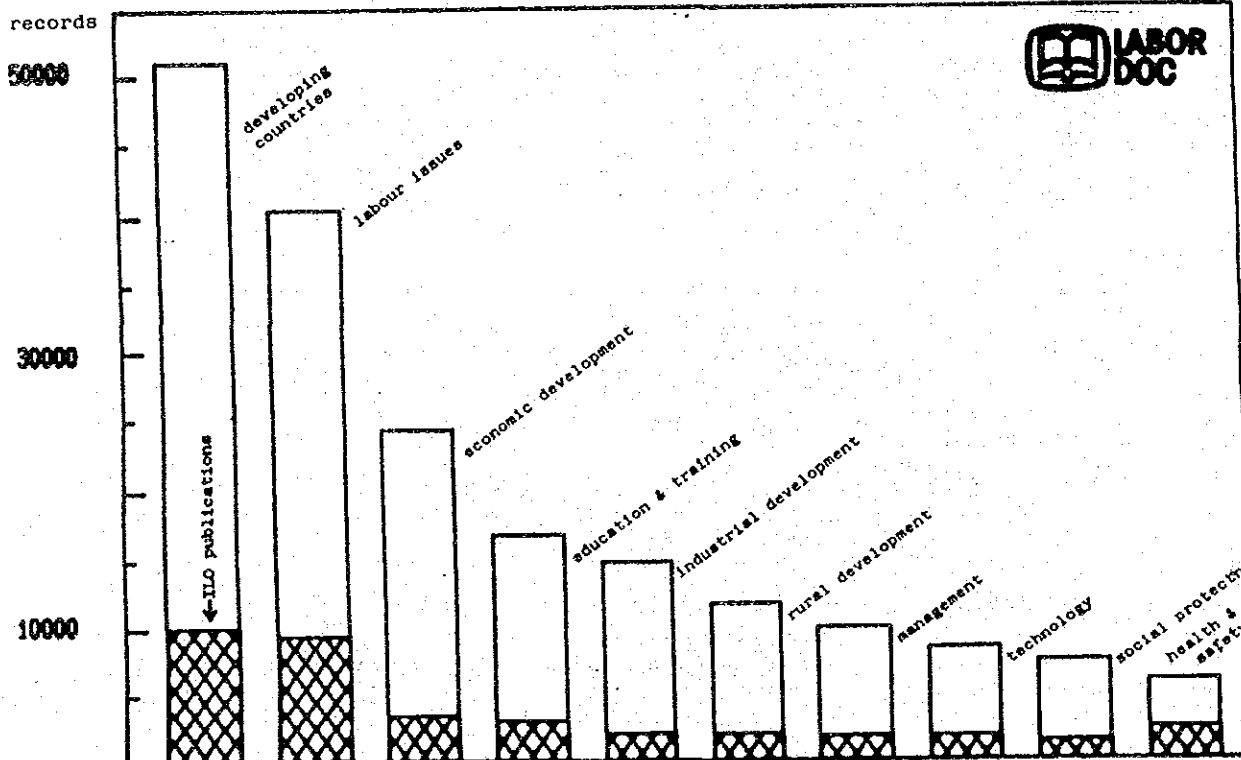
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- Over 140,000 records containing full bibliographic details and indicative abstracts with indexing descriptors selected from the *ILO Thesaurus* (ISBN 92-2-003850-1).
- Available as monthly printed abstract bulletin *International Labour Documentation* (ISSN 0020-7756) or as a cumulative microfiche catalogue.
- Available for retrospective on-line searching through ARAMIS, ESA-IRS, HRIN, ORBIT.*

* ARAMIS, Swedish Centre for Working Life, P.O. Box 5606, S-114 86 Stockholm; ESA-IRS (ESRIN) (European Space Agency), via Galileo Galilei, I-00044 Frascati; HRIN (Human Resource Information Network), Executive Telecom System, Inc. 9585 Valparaiso Court, Indianapolis, IN 46268; ORBIT Information Technologies (formerly: SDC Information Services), Pergamon ORBIT Infoline, Inc. 8000 Westpark Drive, McLean, VA 22102.



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DEVELOPMENT AND APPLICATION OF MINISIS
CHINESE INTERFACE

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1. INTRODUCTION

In the Past eight years, thirty users have installed MINISIS in China, some users are acquiring MINISIS or plan to buy HP3000 computer for using MINISIS now. MINISIS is most welcome computerized information retrieval system in China. Why? I think the main reasons are as follows:

First, it is a powerfull IRS and RDBMS; second, the MINISIS Chinese interface can successfully process Chinese characters; third, IDRC provides MINISIS to users of China free-charge and provides very good services to users.

2. MINISIS APPLICATION REVIEW IN CHINA

Ever since 1981, STIC did the following activities on MINISIS:

- Created four large bibliographic databases which are INSPEC, ISMEC, METADEX and COMPENDEX;
- IDRC and STIC developed a MINISIS Chinese interface together;
- Created a Chinese language bibliographic database;
- Developed an integrated library system;
- Installed MINISIS software and held MINISIS training course for seventeen new users.

Some other users met with success in MINISIS application also, for example, Information Institute of Agricultural Science and Technology created AGRIS, AGRICOLA and CAB databases and provided SOI services for many users; China Population Information Centre developed an information retrieval system; Tiangjing Welding Electrode Manufacturing Factory are using MINISIS to manage technical archive files; Library of Shanghai Air Force College developed an library management system; Luoyang Petro-Chemical Engineering Corporation are creating APILIT and APIPAT databases. Some users created Chinese character databases by using MINISIS chinese interface.

3. CHINESE CHARACTER PROCESSING

Chinese character processing technology involves coding methods, character pattern file organization, the necessary fundamental software, input/output methods and corresponding equipments.

Because number of Chinese characters which are commonly used exceeds 6000, so it is very difficult to design a powerfull DBMS which is similar to MINISIS for processing Chinese character. Usually, users would like to change a DBMS and enable it process Chinese character also, but it is difficult to do for most of DBMS. MINISIS is a multilingual system, it was designed to handle both types of confor-

mable and non-conformable character set, it is not very difficult to enable MINISIS to process Chinese character.

Chinese character set belongs to non-conformable character set, this character set has several thousands characters. There is no special version of MINISIS for handling chinese character set, while use MINISIS Chinese interface to handle Chinese character set.

4. WHAT IS MINISIS CHINESE CHARACTER INTEFACE

This interface consists of following elements:

- Character set definition table
- Character set definition procedure
- Character conversion table
- File attribute table
- Chinese character collating sequence file
- I/O handlers
- Chinese character input code conversion table
- Programs and utilities

5. CHINESE CHARACTER INPUT METHOD AND I/O DEVICES

The national standard for Chinese character set (GB 2312-80) stipulated 6763 Chinese characters. Because there are so many Chinese character, it is very difficult to make and operate a large keyboard representing all Chinese characters. So it is necessary to introduce some input methods for inputting Chinese characters. Up to now, more than four hundreds input methods have been introduced, but only about thirty methods have been used in China.

Although there are many input methods, but most of the input methods are based on either the sound of Chinese character or the decomposition of Chinese character, they can be grouped into two basic categories:

- Code method: Use numerals or alphanumeric characters or Chinese character alphabets to represent Chinese characters, each Chinese character has unique input code which consists of 3 to 5 numerals or alphabets;
- Separation or composition of Chinese character root method: The Chinese character is separated into several root symbols and key those root symbols for a Chinese character.

MINISIS Chinese interface allows users to use many types of I/O devices for inputting/outputting Chinese character. Recently, I/O devices were used in China are as follows:

- HP2693A and HERCULES Chinese/Latin terminals
- Vectra Chinese/Latin workstation
- HP2648 Graphic terminal
- DRAGON D7400 Chinese/Latin terminal
- HP264x character mode terminal
- HP256x dot-matrix line printer
- HP2608 dot-matrix line printer
- HP99994A dot-matrix line printer
- HP4063A/B line printer

- HPC1200A line printer
- HP150 microcomputer

The I/O of Chinese character can be done in one of following methods:

The first method is to maintain a Chinese character pattern file on the HP3000 system and to display the Chinese character using a graphics terminal. The Chinese data are inputted in the form of codes. The input coding system for inputting Chinese character are totally determined by user. STIC has developed an input coding system based on the Telegraph code and the phonetic code.

The second method is to use a specialize bilingual Chinese/Latin terminal in which stored 6763 Chinese character patterns. The input methods depend on manufacturer of the terminals, usually, those terminals permit user to select any one of several input methods to input Chinese character.

6. CHINESE CHARACTER CODING SCHEME AND COLLATING SEQUENCE

Because of large number of Chinese character, it is necessary to use two consecutive bytes to represent a Chinese character. The possible combinations of 2 bytes chinese code give us 49284(222*222) possible values which are enough to represent all of Chinese character. this coding scheme is called the internal coding scheme.

MINISIS can use the national standard coding scheme for Chinese character set or use a special coding scheme which is called encoded telegraph code as internal coding scheme. If using national standard coding scheme, it is easy to exchange data with other users, because most of Chinese character processing system use this coding scheme.

There are several methods for sorting Chinese character, for example, Pinyin method, radical method and stroke method. The most frequently used method is Pinyin method recently. The internal codes of 3008 second level Chinese character in the national standard coding scheme and all Chinese characters in encoded telegraph coding scheme are not arranged in accordance with the Chinese collating sequence, so a sorted Chinese coding scheme is needed. The codes of the sorted Chinese coding scheme used by us are arranged in accordance with the PinYin sorting method. A Chinese character sorting table for mapping the internal Chinese code into the Chinese collating sequence was established by using a program. When sorting Chinese character string, a procedure replace the Chinese character with the corresponding sorting sequence number.

7. MINISIS I/O HANDLERS AND TERMINAL HANDLER TABLE

Each of I/O device for inputting and outputting Chinese character needs a handler. A handler is the interface between the I/O device and the MINISIS, it is used to convert from internal code to external code or vice versa, insert and remove the Character set Identification Code (CSIC), turn the terminal from Roman mode into Chinese mode or vice versa.

All handlers must be catalogued into the SL library, a terminal handler table which was entitled TERMHDR must be established in the

pub group of logon account. The TERMHDR file contains some records which are linkages between the I/O device and handler. Each record contains a logical unit number of a I/O device, name of handler and six parameters for describing features of terminal. The logical unit number of the spooled line printer is defaulted zero. If using the encoded telegraph code as the internal code of Chinese character, the TERMHDR.PUB may contain following lines:

```

nnnHANDLER100011118  << FOR HP256X LINE PRINTER >>
nnnHANDLER11001111  << FOR HP150 MICROCOMPUTER >>
nnnHANDLER12000011  << FOR DRAGON D7400 TERMINAL >>
nnnHANDLER13001111  << FOR HP2648 GRAPHIC TERMINAL >>
nnnHANDLER14000100  << FOR HP2693A AND HERCULES TERMINAL >>
nnnHANDLER14000100  << FOR VECTRA CHINESE/LATIN WORKSTATION >>
nnnHANDLER15001111  << FOR HP2608 LINE PRINTER >>
nnnHANDLER16001111  << FOR HP264X CHARACTER CODE TERMINAL >>
nnnHANDLER17000000  << FOR HP99994A LINE PRINTER >>

```

Where nnn is a logical unit number.

If using the GB code as internal code of Chinese character, the TERMHDR.PUB file may contain following lines:

```

nnnHANDLER03001111  << FOR HP150 MICROCOMPUTER >>
nnnHANDLER04001111  << FOR HP264X LINE PRINTER >>
nnnHANDLER050011118 << FOR HP256X LINE PRINTER >>
nnnHANDLER07001111  << FOR HP2608 LINE PRINTER >>
nnnHANDLER08000100  << FOR HP2693A AND HERCULES TERMINAL >>
nnnHANDLER08000100  << FOR VECTRA CHINESE/LATIN WORKSTATION >>
nnnHANDLER09000000  << FOR HP4063A/B AND HPC1200A LINE
PRINTER >>

```

Where nnn is a logical unit number.

8. CHINESE CHARACTER DATABASES

It is most interested to use MINISIS Chinese interface to create and maintain Chinese character databases for MINISIS users in China, some users have created Chinese character bibliographic databases and management databases. The method for using MINISIS processors to handle Chinese character databases is basically similar to the method for handling English databases. The Chinese character databases can store Chinese string and Roman string, all processors can successfully recognize and process both Chinese string and Roman string.

9. MINISIS RESOURCE CENTRE FOR CHINA

During the last year, the MINISIS Resource Centre(MRC) for China was established within STIC, it is a IDRC-sponsored project. MRC have provided and will continue to provide the following services:

- Conduct the standard MINISIS introductory training course of three weeks to new MINISIS users in China;
- Establish a MINISIS user group in China, coordinate the activities of the MRC and provide support services to its members;
- Publish a newsletter for MINISIS users in China;
- Produce Chinese language of MINISIS-related documentation;

- Encourage MINISIS application in China;
- Maintain regular contact with all licensed users of MINISIS in China.

I think that it's a very good Idea to establish MRC, all users in China can benefit from the MRC.

The MINISIS Chinese interface received highly appraise at a national evaluation meeting which was held in Beijing last year, all experts firmly believe that this Chinese interface has achieved advanced level in the world, they proposed that popularize MINISIS in China. So the number of MINISIS user in China will be on the increase in the next several years.

付属資料8 MINISISと他言語とのプログラミング講習テキスト
(プログラミングインターフェイス)

workshop

Programming Interface in

C, Pascal, Cobol

Room 415

15:00 - 16:00

15 september

MUG '88

Topics to be discussed

1. Program architecture
2. Data types
3. High-level Intrinsic
4. External procedures
5. Run-time environment
6. Program preparation
7. Exit preparation

Program architecture

- A program consist of data and code
- code is divided into segments. On HP3000, a program has up to 64 variable-length segments of code. Each segment is up to 32K byte. On 900 series, Code is up to 2G byte.
- Each program has one data segment. On HP3000, data segment is restricted to 64K byte. On 900 series, data segment is up to 2G byte.
- On HP3000, program segmentation is controlled by a programmer. On 900 series, program segmentation is done by hardware. A program is divided into fixed-size pages.
- MINISIS is centered around the HP3000 stack architecture. The addressability of data is limited to 64K byte. On 900 series, it is not clear how a native-mode program to handle a compatibility-mode procedure.

Data types

Small integer (-32768 - 32767)

SPL:	integer, logical
COBOL:	Pic S9(4) usage COMP
PASCAL:	type sint=-32768..32727
C:	short

Integer (-268435457 - 268435456)

SPL:	double
COBOL:	pic S9(8) usage COMP
PASCAL:	integer
C:	long

Byte (0 - 255)

SPL:	byte
COBOL:	pic x
PASCAL:	char
C:	char

Array of small integer

SPL: integer array, logical array
COBOL: pic S9(4) usage COMP
 occur x times
PASCAL: array[1..n] of sint
C: short xx[n]

Array of integer

SPL: double array
COBOL: pic S9(8) usage COMP
 occur n times
PASCAL: array[1..n] of integer
C: long xx[n]

Array of byte

SPL: byte array
COBOL: pic X occur n times
PASCAL: packed array[1..n] of char
C: char xx[n]

Record structure

SPL: integer array xx(0:10)
 byte array yy(*)=xx
 define int=xx(0)##;
 define byt=xx(2)##;
COBOL: 01 record.
 05 int pic S9(4) COMP.
 05 byt pic x.
PASCAL: record
 int: sint;
 byt: char;
 end;
C: struct record{
 short int;
 char byt;
};
 record xx;

String Type not used

High-level intrinsics

- High-level intrinsics permit user to write application without in-depth knowledge of MINISIS internals.
- These intrinsics are designed to interface with high-level 3GLs. The calling sequence is confirmed with the following specifications:
 - . it is not a typed procedure.
 - . parameters are passed by reference.
 - . parameters are passed in word-address
 - . fixed number of parameters
- High-level intrinsics can be broken into six categories:
 - DBMS
 - Inverted file manipulation routine
 - Record displaying routine
 - I/O routine (terminal and printer only)
 - user dialogue
 - Utilities

External procedures

- An external procedure is stored outside an application program and is binded to a program at run-time and/or program preparation time.
- MINISIS external procedures are stored in the SL library. When a program is run, users have to specify which SL is binded to the application program. ie.

```
:run program;lib={G | P | S}
```
- For Cobol, external procedures can be called without making previous declaration. No checking is done on parameter type and number of parameters

Call 'PROC' using PARM1,PARM2.
- For SPL, external procedures have to be declared before they can be used. MINISIS provides all formal declarations of high-level intrinsics in INTRINS.PUB.MINISIS.

```
INTRINSIC(INTRINS.PUB.MINISIS) PROC;
PROC(PARM1,PARM2);
```

- Pascal expects that a procedure must be declared before using it. ie.

```
procedure PROC(var PARM1: sint;
               var PARM2: sint);
external SPL;
PROC(PARM1,PARM2);
```

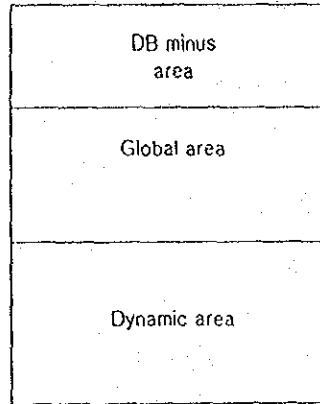
- C expects that a procedure must be declared before using it. ie.

```
extern void PROC(short *PARM1,
                short *PARM2);
PROC(PARM1,PARM2);
```

** Please note that CCS/C does prototype checking.

Run-time environment

- MINISIS is designed around the HP3000 stack architecture. When a program is run, MINISIS expects the data stack (data segment) is set up as follows:



DB minus area is not accessible from 3GLs except SPL. This area is used by MINISIS,

and MPE subsystems. ie.

MINISIS communication area
 V/PLUS form buffer
 PASCAL heap area
 CCS/C dynamic spaces area

- MINISIS and HP subsystems call the PASCAL heap management routine to manage this area. This area is expanded when more spaces are needed.
- MINISIS requires the first 700 word of this area. It means that MINISIS has to make the first call to the PASCAL heap routine.
- Programmers must include the INITPROG call in their program so that MINISIS can obtain the first 700 word of DB minus area.
- The startup routine of CCS/C is executed before the first statement of a program. It acquires spaces from the DB minus area. MINISIS does not function properly because some spaces in the first 700 word are

used by CCS/C.

- The workaround of this problem is to rewrite the startup routine. CCS/C permits users to customize the startup routine. The first statement of the startup routine is to call INITPROG.

Program preparation

- An application program could be prepared in SPL, COBOL, PASCAL or CCS/C.
- If a HP3000 program is greater than 32K byte, a program has to be broken into segments. Segmentation is controlled by programmers, ie.

COBOL: Procedure division.
segment1 section 02.

segment2 section 03.

SPL: \$control segment=segment1

\$control segment=segment2

PASCAL: \$SEGMENT segment1\$

\$SEGMENT segment2\$

- For CCS/C, Segmentation is done by the linkage editor(CLINK).

```
NS      <---segment1
Re,crel1
Re,crel2
NS      <---segment2
```

- A source program is compiled into an USL. The linkage editor(segmer or CLINK) prepares a program from an USL(or CREL). A program has to be prepared with the following parameters:

USLs:

Prep USL,PROG;dl=700;maxdata=32000;&
cap=ia,ba,ds,mr,ph

CRELs:

CLINK -RE:crel,-Ou:PROG,-DI:700,&
-IA,-BA,-DS,-PH,-MR,MD:32000

- A program has to be run with a SL library.

Exit preparation

- An exit is a procedure in a SL library. It is not a stand-alone program and must be called by other procedure or a program.
- An exit can has local variables which are allocated at each calls and access global data through parameters.
- The source of exit is prepared in either SPL, COBOL, PASCAL or CCS/C. An exit is compiled into an USL. If CCS/C is used then programmers must run MOVECREL to convert a CREL to an USL. The USL of exit contains no outer block and has one or more segments.
- A compiler meta command has to be included in the source of exit in order to eliminate the outer block. ie.

SPL: \$control subprogram

```
$control segment=cxproc
procedure cxproc(x);
integer x;
```

```
begin
```

```
end;
```

COBOL: \$control dynamic
identification division.
program-id. cxproc.
data division.
linkage section.
77 x pic s9(4) usage COMP.
procedure division using x.

PASCAL: \$subprogram\$
\$segment cxproc\$
procedure cxproc(var x:sint);
begin

```
end;
```

```
CCS/C: void cxproc(short *x);  
{  
}  
/* omit main() */
```

- An USL contain one or more segments. A segment consist of one or more procedures. The procedure name is the same as the exit name. The segment name is named by programmers or compiler.

- An exit is added to the SL library through segmenter. the segment containing the exit is added to the SL library. ie.

:Segmenter

-SL SL

-purgesl segment,cxproc

-usl usl

-addsl cxproc

-exit

- High-level exit names must be started with CX and followed with alphanumeric string.

JICA