MINISIS USERS' GROUP MEETING 1991

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This series includes meeting documents, internal reports, and preliminary technical documents that may later form the basis of a formal publication. A Manuscript Report is given a small distribution to a highly specialized audience.

La présente série est réservée aux documents issus de colloques, aux rapports internes et aux documents techniques susceptibles d'être publiés plus tard dans une série de publications plus soignées. D'un tirage restreint, le rapport manuscrit est destiné à un public très spécialisé.

Esta serie incluye ponencias de reuniones, informes internos y documentos técnicos que pueden posteriormente conformar la base de una publicación formal. El informe recibe distribución limitada entre una audiencia altamente especializada.

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MUG '91

United Nations Economic Council for Latin America and the Carribean (UN-ECLAC) and the University of the West Indies (UWI)

le Conseil économique des Nations Unies pour l'Amérique latine et les Caraïbes (UN-CEPALC) et la University of the West Indies (UWI)

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MEDLINE under MINISIS

Abel L. Packer, Adalberto O. Tardelli, and Marcia y. Barretto

1. Introduction

MEDLINE data base is produced by United States National Library of Medicine. It is one of the 36 MEDLARS (Medical Literature Analysis and Retrieval System) data bases. MEDLINE states for MEDLARS on-LINE. It contains bibliographic references to more than 3200 international biomedical journals published worldwide since 1966, which corresponds to about 300000 records annually.

NLM delivers annual replacement tapes for the entire data base as well as monthly maintenance and update tapes.

BIREME has a subset of NLM MEDLINE data base corresponding to years 1983-1991 installed in its HP3000/950 computer under MINISIS. The NLM's mandatory recommendations for MEDLINE licensed installation are followed.

MEDLINE data base is available for on-line search, from local or remote terminals, using MINISIS QUERY processor.

2.MEDLINE Installation and Maintenance Processing Overview

BIREME runs MEDLINE data base in a HP3000/950 installation with 64Mb of main memory, 5.8Gb of hard disk and X.25 telecommunications access.

MEDLINE installation and maintenance is a complex and time consuming process. The high volume of data combined with a complex record format conversion demands intensive use of CPU and disk storage. BIREME implemented a special set of procedures combining several tools, including MINISIS, MicroISIS, SPL programs and programs using CISIS Interface, in order to increase the speed of the process and to optimize the disk space usage.

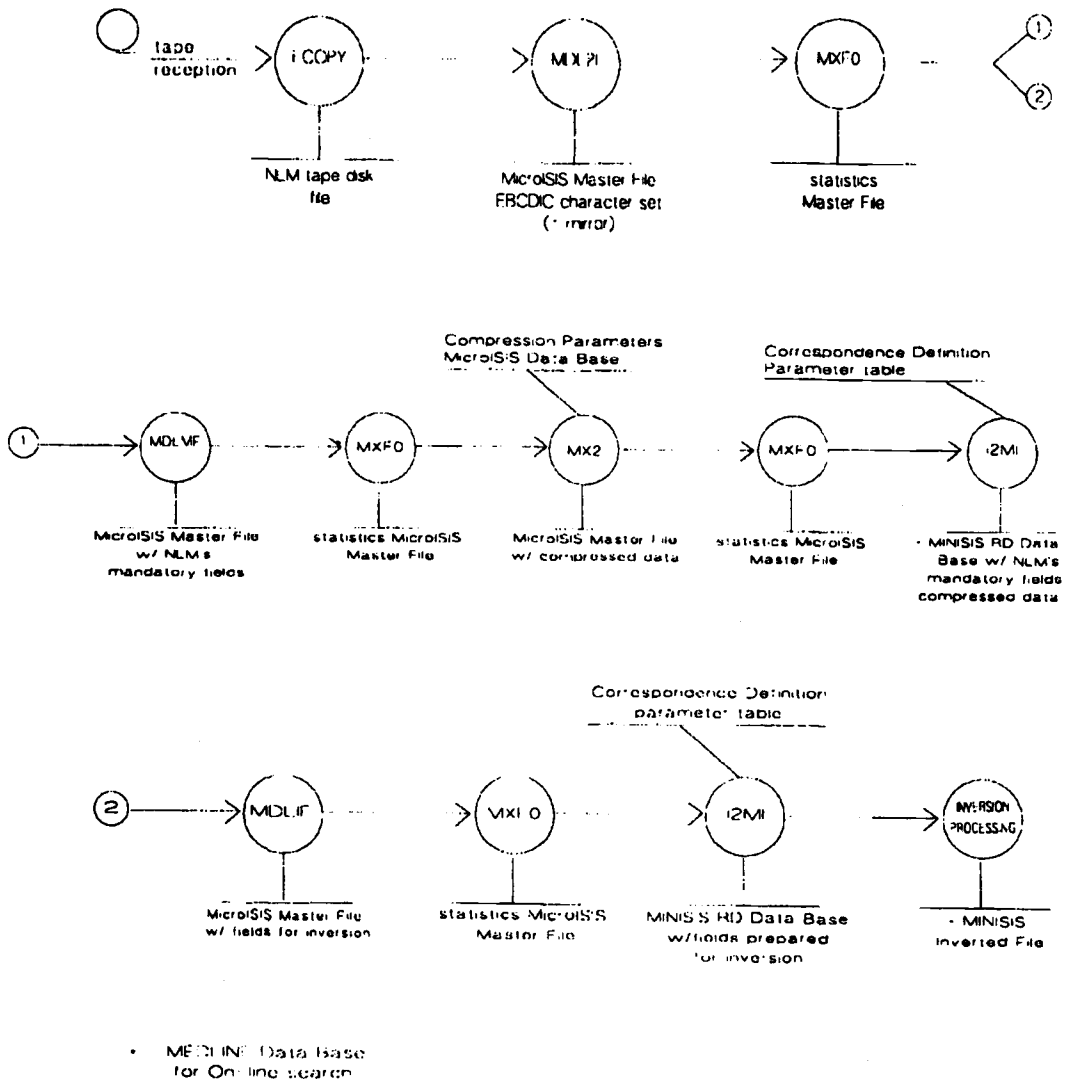
MEDLINE process includes the following sequential steps:

- MEDLINE tapes reception and initial processing;
- Conversion from MEDLINE Record format to MicroISIS Record format;

- Conversion from MEDLINE field structure to LILACS field structure;
- Data compression and load MINISIS data base;
- MINISIS inverted file generation.

Fig.1 displays graphically these steps.

Figure 1: MEDLINE Installation and Maintenance Processing



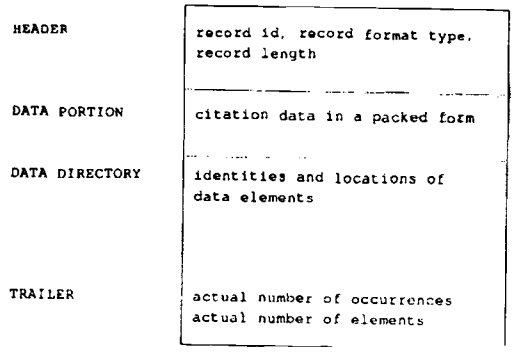
2.1. Step 1 - Tapes Reception and Initial Processing

BIREME monthly receives NLM tapes. As the tapes arrive, they are checked for the readability and a back-up is done. For this process it is used the FCOPY MPE/XL utility.

2.2. Step 2 - Conversion from MEDLINE Record Format to MicroISIS Record Format

MEDLINE record format (see fig. 2) is converted to MicroISIS record format in order to facilitate subsequent processing - field conversion and data compression, which demand special programming. MicroISIS data base was selected because BIREME's high level CISIS Interface could be used offering powerful programming capability. Programming interface to MINISIS data base in BIREME's installation was only possible using HP machine oriented System Programming Language (SPL)

Figure 2



A C program (MDL2I) does the conversion from input file in MEDLINE record format to a MicroISIS Master File. Extensive logical and quantitative checkings are done in order to assure record, file and character set integrity. All original MEDLINE data elements are loaded in the MicroISIS Master File, maintaining the original EBCDIC character set, so the MicroISIS data base constitutes a perfect mirror of the MEDLINE tape.

2.3. Step 3 - Conversion from MEDLINE field structure to LILACS field structure

BIREME operates a data base called LILACS which stores references to health literature produced in Latin America and Caribbean. The data base input is done decentralized by national network centers. BIREME uses a bibliographic record format derived from UNESCO Unisist Reference Manual, following the adaptation done by the United Nations ECLA Bibliographic System. Indexing for LILACS follows the same rules NLM uses for MEDLINE.

LILACS data base was already operating under MINISIS when BIREME planned to implement MEDLINE data base at its installation. In order to make use of all methodology, parameters and procedures already implemented for LILACS, MEDLINE field structure is converted to LILACS field structure. LILACS comprises all types of literature while MEDLINE is restricted to journal articles.

A C program (MDLMF) does the conversion from MEDLINE field structure to LILACS field structure. Some special processing is done:

- subject descriptor field is converted to the format it will be displayed;
- standard input data character codes are converted to ASCII codes;
- diacritical marks are translated to codes less than ASCII blank;
- some fields, specific to NLM, are not output.

Again, logical and quantitative checking is done to assure integrity. The resulting output of this processing, is a MicroISIS Master File containing the NLM's mandatory fields is created.

2.4. Step 4 - Compression and MINISIS Master File Loading

To optimize disk space usage, an algorithm for data compression was implemented. After exhaustive testing with one sample tape, the 128 most frequent patterns were selected. These patterns are compressed to one byte code from ASCII 128 to ASCII 255. The corresponding compress table is stored in a MicroISIS data base

A C program (MX2) using, as input, MEDLINE in MicroISIS Master File format obtained in step 3 and the compress MicroISIS data base produces, compressed MEDLINE in MicroISIS Master File.

Because of the high volume of data to be processed and the need to speed up the time it takes to load annually the entire MEDLINE data base, it was implemented a C program (I2MI) that loads MicroISIS data base in MINISIS data base using a correspondence definition table to convert the field tags.

2.5. Step 5 - MINISIS Inverted File Generation

A C program (MDLIF) converts MEDLINE field structure to LILACS field structure, processing just the fields needed for the inverted file generation:

- punctuation and diacritical marks are not output;
- input data character codes are converted to ASCII codes.

A special processing is reserved for subject descriptors. Indexing rules have the concept of primary and secondary descriptors, as well as, of the subject with its corresponding qualifier. Descriptors and qualifiers can appear in the following formats:

Descriptor

Descriptor/qualifier

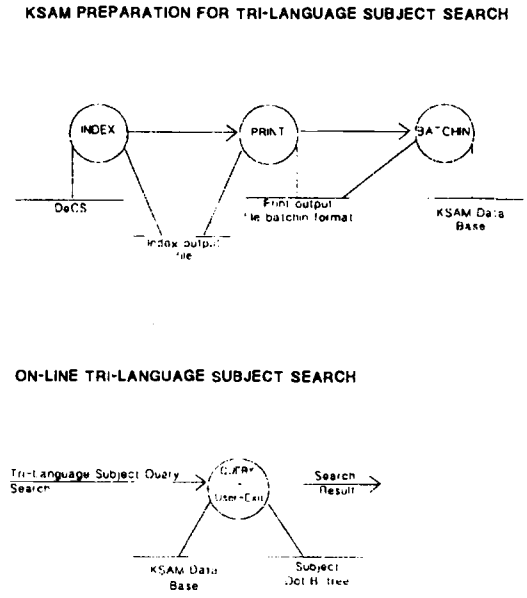
.Descriptor/qualifier

-Descriptor/qualifier

Search in such a field structure needs to combine adjacent B-tree and dot B-tree techniques which are not available in MINISIS. To solve this problem, we implemented a set of procedures that prepares a special invert input index file. First it uses the Minisis INDEX processor to extract the descriptors and its corresponding qualifiers; second a SPL program prepares the keys for inversion: if the subject has a qualifier it is output twice -without the qualifier and with the qualifier appended to the descriptor with a slash as delimiter; and finally the corresponding sort is done.

In addition, search in spanish and portuguese is available. To achieve this, based in DeCS (Health Science Descriptors) we construct a KSAM file with prohibited and authorized descriptors in english, spanish and portuguese that is accessed by a QUERY user exit. Fig. 3 shows the corresponding data flow.

Figure 3



3. On-line Operation

The MEDLINE data base is available for on-line search 24 hours daily. There is 8 logical lines in a X.25 telecommunication access to attend approximately 300 potential users that have already subscribed the on-line service at BIREME.

Bibliographic Reference:

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