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# SOYUZMEDINFORM COMPUTER TECHNOLOGY AND SOVIET MEDICAL DATA BASES

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**Abstract:** The paper deals with the USSR medical libraries network on union, republican and regional levels. It describes the conception of information-library environment for medical libraries network including stage-by-stage development of computer technologies of problem-orientated data bases generation in national largest libraries, computer catalogue network, unified interlibrary information centre and telecommunication media creation, ensuring on-line access to data bases and catalogues.

It dwells upon integrated technology of Soviet bilingual biomedical data base existing in SOYUZMEDINFORM State Central Scientific Medical Library (GCNMB) and upon modes of its maintenance on magnetic and paper carriers.

## 1. Network of the USSR medical libraries

The system of medical information in the USSR aims at meeting informational needs of many medical, health and health-related staff (i.e. 1.2 million physicians and 100 thousand researchers and teachers are engaged in the USSR health services). The most important element of this system is a network of medical libraries including over 4000 specialized libraries of different levels. The structure of this network is presented in fig. 1.

Over five thousand people work in national medical libraries. The scientific and production association of SOYUZMEDINFORM is the main information centre in the field of medicine comprising the All-Union Scientific Institute for Medical and Med-technical Information (AUMI), the Printing Plant (PP) and the State Central Scientific Medical Library (SCSML). The SCSML, with over 2.2. million volumes, is one of the world's largest medical libraries. Daily the SCSML provides about 1000 readers with 4.5 thousand documents. Annually 1.7 million

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pages are copied and 11 million journal page copies are microfiched for the network needs. The SCSML makes a centralized acquisition of foreign periodicals for medical libraries subscribing to about 2000 journal titles.

In order to ensure a better selection of foreign books and more effective use of foreign currency allocations SOYUZMEDINFORM regularly arranges book exhibitions of foreign publishing houses during which it makes its own purchases and serves as a mediator for other consumers of medical literature.

Besides, the SCSML makes a wide exchange of books and journals with over 1000 foreign organizations from 80 countries of the world. The SCSML receives without fail almost all Soviet books on medicine, transactions of research institutes and conference proceedings. Parts of this literature are directed to the exchange stock for the libraries network of this country and some developing countries.

The second level of the network is composed of 14 scientific medical libraries of the republics (RSML) which in their turn have their own networks comprising 96 medical libraries of the regions and 3.5 thousand libraries in health facilities and medical schools. The SCSML also functions as a republican medical library of the RSFSR. The leading role in the system of medical information belongs to 100 libraries in medical universities and higher educational establishments as well as to 340 libraries in research institution.

## **2. Information - library network conception**

The consequence from the above-mentioned is that there is a widespread network of libraries in the country. It needs up-to-date information systems ensuring more effective use of the acquired stock by automatic information retrieval and modern means of document delivery to consumers on the basis of computer science and telecommunication.

The final aim of the information system consists in providing every user wherever he lives with required literature retrieval and in case of necessity with the originals or with their copies.

Therewith it is very important to ensure that the retrieval includes all domestic and foreign literature and a minimum service-time.

In our opinion the aim will be achieved provided the following tasks are consequently carried out:

1. The technology of bibliographic data base generation for domestic part of the stock on fixed profile is developed and implemented in the largest libraries.

2. An universal information-library system on the basis of electronic catalogue with tele access is developed and implemented in all libraries.

3. A powerful information centre is founded for tele access to all including foreign data bases in the territory of the country and abroad as well as for producing domestic data bases on CD-ROM.

4. A telecommunication media is created for library stock users ensuring on-line access to catalogues and electronic data communications.

The first element of the information system may be introduced into Soviet libraries on the basis of personal computers even today.

### **3. The general scheme of the SOYUZMEDINFORM information technology**

SOYUZMEDINFORM is an ALL-Union branch medical information centre and forms a structural part of the USSR Ministry of Public Health. All three members (AUIMI, SCSML and PP) work along the uniform technology shown in fig. 2.

In the framework of this technology SOYUZMEDINFORM participates in the following activities.

- acquisition of SCSML document stock;
- generation of bibliographic and factographic data bases on medicine and health care;
- publication of information materials (medical abstract journal, reviews and express-informations on various medical and health care fields, bibliographic indexes, Medical Market, a joint Soviet-American journal, and other materials);
- production of audiovisual information;
- information servicing on the basis of conventional library services, information publications' dissemination and use of domestic and foreign data bases in on-line and off-line modes;
- studying the demand in biomedical information;
- sociological studies in the fields of medicine and health care;
- development and introduction of new computer information technologies.

This paper deals more closely with the automated technology of generation and application of a bibliographic data base for the Soviet medical literature.

### **4. Integrated technology of Soviet biomedical data base generation**

In 1988 a new computer technology was developed and implemented in SCSML SOYUZMEDINFORM which made it possible to create a complete data base on

**Soviet medical literature in the USSR for the first and to arrange wide informational service on its basis.**

**The technology was founded on the following principles:**

- 1. to ensure the completeness of the data base in relation to Soviet Medical literature**
- 2. integration of library, publishing and information processes within SOYUZ-MEDINFORM (internal integration).**
- 3. integration with external Soviet and foreign information technologies in the sphere of biomedicine (principle of external integration).**

**The principle of international integration means integration of the SCSML electronic catalogue with the publishing process of bibliographic indexes and information process of the SCSML readers service.**

**The principle of external integration stipulates the transition to the world's widespread system of documents' indexing (MeSH), translation of titles into English and provision for the access to the data base in the territory of the USSR and abroad.**

**The technology is thus designed as to satisfy the following indices:**

- 1. The generation of the computer data base on Soviet medical literature amounting to 85-100 000 documents of which 60-80 000 are translated into English.**

**The data base includes the following documents:**

- 3600 Soviet books;**
- 150 medical journals;**
- 25 000 journal articles;**
- 45 000 articles from institute transactions and conference papers;**
- 6700 dissertations;**
- 4500 non-published materials (deposited manuscripts, normative and methodic instructions, translations);**
- 10 000 informational materials on research and development;**
- 500 algorithmes descriptions and programs in the filed of medicine and health care.**

**This flow involves 95% of all Soviet medical literature.**

- 2. Publication of 100 000 catalogue bibliographic cards of 1000 copies each.**

3. Publication of a weekly index of current literature from the data base in Russian and English (52 issues of 1000 copies).
4. Publication of 10 special bibliographies by 12 issues per year.
5. About 5000 searches in selective dissemination of information.
6. At least 1500 on line searches from domestic and foreign data base.
7. Data-base copying for the library network and other information centres.
8. Not exceeding of a fortnight period of document processing before input.
9. Provision of original copies by results of computer retrieval and current index search.
10. Translation of documents into foreign languages on request of foreign users of the data base. Besides the technology ensures the depth of indexing and low percentage of spelling errors.

At initial stage all first copies of documents are received by document flow control department where the book and articles are recorded, marked out and coded.

The coding consists in attaching library deposit number whereas marking out contains instructions as to the necessity of including the document to the data base for domestic or external use. Besides the document continuous flow is being regulated here for data base input.

Further on the documents marked out are sent for indexing. Since 1990 the Soviet medical literature has been indexed by MeSH thesaurus of the US National medical library and additional descriptors are included to reflect the specificity of the Soviet medical terminology.

It is worth noting that up to now the Soviet medical literature indexed by the SCSML list of subject headings. In spite of all difficulties related to recataloging of numerous medical libraries network and retaining of users, we consider the transition to new linguistics being necessary for international standards in reference tools. The main problem facing the SCSML as data base generator consisted in creating its own bilingual thesaurus needed not only for operating new descriptors in complicated polyhierarchical MeSH structure but also for continuous refining of Russian equivalents of US terminology. For this purpose a software application package has been designed for DBASE III + language to fulfill the following functions:

- development of MeSH current version including verification of terms and relations;
- inclusion of national thesaurus
- verification of non-contradiction of input information and editing of descriptive article;
- development of the main machine dictionaries and thesaurus relations in any language;
- computer generation and output for printing of various thesaurus representation (hierarchical, alphabetic, permutational indexes in any of input languages);
- random retrieval of bilingual thesaurus terms.

At the same time a bilingual thesaurus is used for English equivalent by computer substitution of Russian terms in case of bibliographic base transfer to foreign users. At present time a linguist automated workbench is under development which would increase the quality and efficiency of indexing.

After indexing and translation the documents are transferred to input and editing department. They are input edited at automated workbench of bibliographer-operator who fulfils the following menu operations:

- chooses input format for all documents at monographic and analytical levels;
- automatically generates standard bibliographical description for all types of documents in standard size bibliographical cards on screen and on paper;
- inserts editor's corrections to document descriptions.

The input of documents into data base requires high level of dispatcher service organization, which provides working schedules for operators; disseminates literature, controls and records activities. This work is performed by automated dispatcher workbench. After the document input the information is printed on the bibliographic card which is circulated for the medical libraries network. Simultaneously the current data-base are loaded to serve readers and automated publishing systems for current bibliographical indexes. Once a month the information is loaded into retrospective data-base for on-line access. The retrospective base is installed in VNIIPAS located in Moscow and in DIMDI (German Institute of Medical Information and Documentation) situated in Koeln, FRG.

The current data base contains information of the last three months and is maintained on IBM PC-386 with disc memory of 160 megabytes in programming environment including information retrieval system of micro CDS/ISIS and additional software which makes it possible besides retrieval to fulfil the following operations:

- automatic preparation of standard bibliographic cards;

- automatic request for original copies and presentation of standard request form on the results of data base retrieval without preliminary search;
- computer generation of current and cumulative bibliographic indexes;
- data base updating for profile request (selective dissemination of information) and the automatic implementation;
- computer transliteration of Cyrillic alphabet into Latin alphabet;
- data conversion from ISO-2709 format into text format and vice versa and from ISO-2709 format into DBASE format and vice versa;
- computer updating of bilingual polyhierarchical thesaurus for retrieval prescription.

The data base is accumulated simultaneously with loading of automatic system for publication preparation (Desc-Top Publishing). The hardware of this system includes scanner, IBM PC AT with megabyte Winchester disc and colour monitor and Hp LAZER JET+. VENTURA PUBLISHER (VP) is used as standard software. In addition DBASE-VP converter has been elaborated. Due to this system a number of automatic bibliographical indexes are being published. The Index of Current Medical Literature in the USSR is one of the basic weekly publications in English and Russian. This index consists of three major parts: document bibliographical descriptions, permutational (keyword-in-context) titles index and author index. At present time the SCSML SOYUZMEDINFORM has installed telecommunication peripheral for the on-line-access to domestic and foreign data bases via VNIPAS. Besides, there are two workstations with CD-ROM technology installed in the SCSML which have MEDLINE and DRUG INFORMATION data bases.

## 5. Conclusion

This paper deals with systemic fundamentals and practical results of computer technology development of informational products on the basis of a large scientific library stock using personal computers. We believe that this technology may become a typical element of the general information network of major national libraries developing a unified electronic catalogue, that would function on the basis of a powerful computing centre firmly ensuring on-line access.

The information-library technology developed in SOYUZMEDINFORM has low costs and high reliability and provides production of international standards with wide possibilities for informational products. All these qualities have made it possible to find a great number of consumers. Suffice it to say that already today this technology is applied in more than a dozen national libraries and information

centres, to which the biggest Saltykov-Shedrin Library in Leningrad and USSR AS GPNTB belong, as well

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Fig. 1: Structure of the USSR medical libraries network

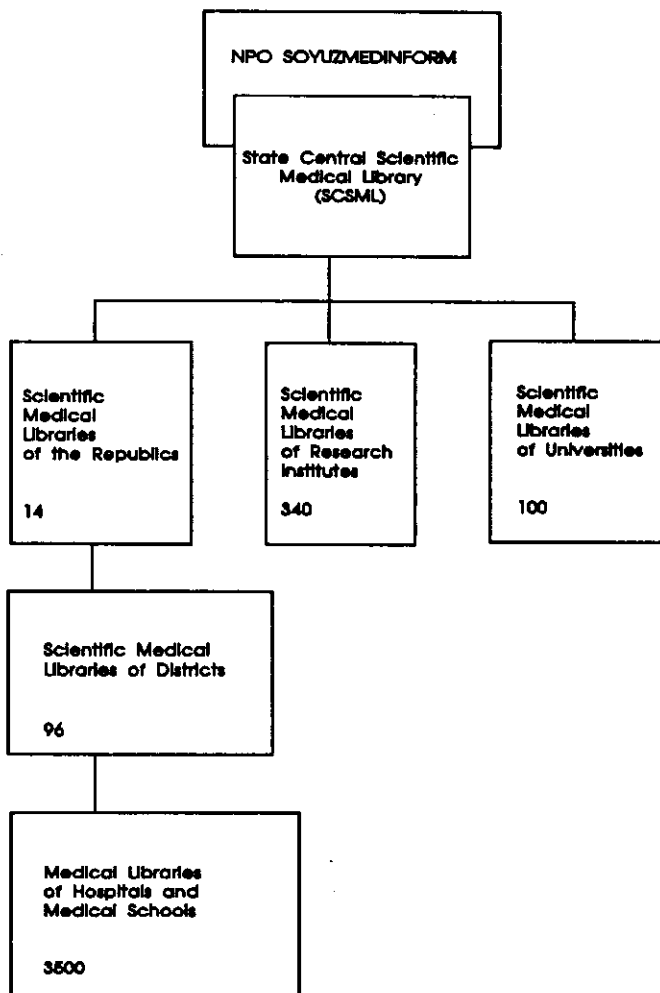


Fig. 2: General scheme of NPO "SOYUZMEDINFORM" informational technology

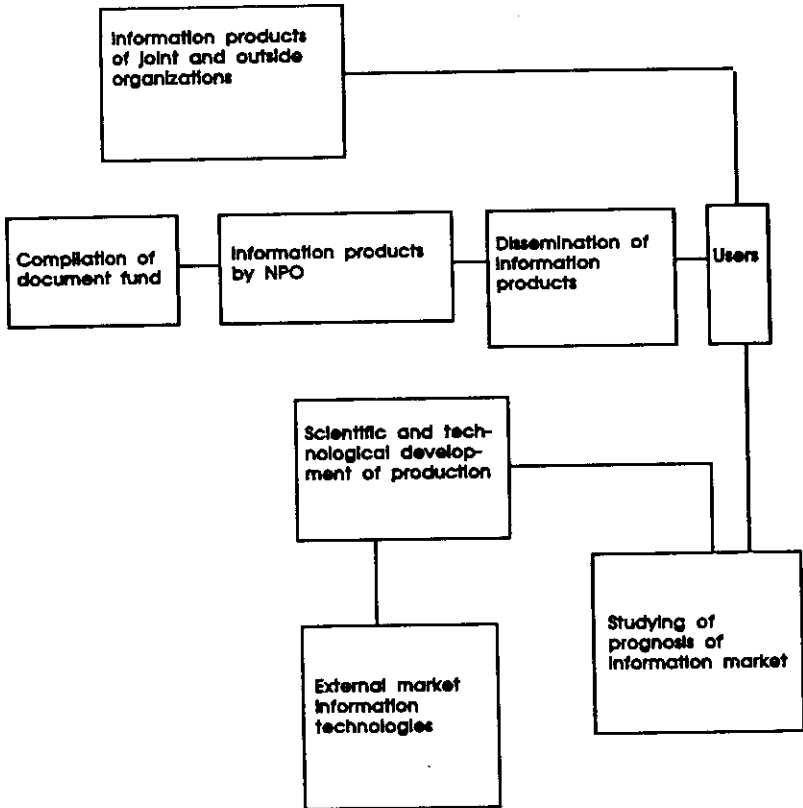


Fig. 3: Outline of NPO SOYUZMEDINFORM computer technology

