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Project of the Medical Virtual Library (MEDVIK) in the Czech Republic

Introduction

Evaluation of the statistic data that have been collected by the National Medical Library in Prague over the last 10 years showed that a high number of local library-information systems, which were not interconnected, were used in the Czech medical libraries. Also, partnership with the European Association for Health Information and Libraries (EAHIL), the contacts and collaboration with colleagues from all over Europe established in 1992 have brought enormous international experience in the field of integration of library-information systems (LIS). The MEDVIK project team intends to develop and introduce a new integrated medical library-information system into the environment of Czech medical libraries in a period of four years (2000-2003). This system will work on the basis of Internet technologies, which will allow a user to access various types of information sources in real time. The paper describes the experience and the results of the work on the project in the first 2 and a half years of implementation of the project.

Medical Care in the Czech Republic

With the population of 10.3 million inhabitants and the population density of 131 inhabitants per km2, the Czech Republic ranks among the smaller European countries.

We can describe the medical care in the Czech Republic by using the following data: the total expenditures amounted to 7.44% of GDP in 2000; there were 25,405 registered medical facilities, in which 38,330 physicians and 107,000 medical officers with secondary education worked in the said year.

The expenditures on medical care are paid from public funds, which are generated by the insurance premiums collected by medical insurance companies, and from the private funds of individuals.

Medical Libraries

The registered number of medical libraries is around 134 information facilities of various types, operating in medical centres. The types of library-informational services depend on the type of the given medical centre, in which the library has been established: a hospital with a policlinic, specialised medical institutes, scientific and research centres, health officer stations, medical spas and educational institutions. In total, the informational resources amount to 1 million 850 thousand physical volumes with subscription for 3,449 foreign periodicals and 15,652 local (Czech) periodicals. From these resources, there are 1 million 227 thousand loans, 25 thousand retrieval services and 3 million 735 thousand copies provided every year.

The MEDVIK Project

The funds for implementation of the project were obtained in the amount of 670 thousand EUR from the Czech Ministry of Education and in the amount of 330 thousand EUR from the Ministry of Health for the years 2000 – 2003. A team of co-workers from the four institutions given below participate in implementation of the project: National Medical Library, Institute for Postgraduate Medical Education, Institute for Clinical and Experimental Medicine and Institute of Hematology and Blood Transfusion.

The goal of the MEDVIK project is

- to create a national network of informational sources for medical science and research, interconnected with similar international systems
- to support and extend sharing of informational sources in order to increase the quality of the provided treatment
- to receive (raise) funds for acquisition of unique journals for science and research
- to allow for acquisition of the Document Delivery Services JASON (Journal Articles Sent on Demand) from Bielefeld
- to allow for access to foreign databases from the Scientific and Technical Network from Karlsruhe

Implementation Phases

When the project was started **in the year 2000**, the process of **defining the system requirements** was taking place. **Analyses and evaluations** were carried out to identify the demands to be made on the system and to prepare the source materials for selection of the optimal solution. The analyses and evaluations concerned the following aspects:
- the functions of the existing LIS institutions participating in the project (see Table 1)
- the data structures used by LIS
- the working procedures used in cataloguing
- the provided library services, with focus on easy and quick reference and use of these services, especially the document delivery service

Table 1
Automated library systems (ALS) used in the institutions implementing the MEDVIK project
- status in the year 2001

Institution	ALS	Implementation since the year	Total number of stored catalogue files (rounded to thousands)	Retrospective from the year	Document types	Implemented modules
National Medical Library	Aleph 300.05 (Ex Libris – Israel)	1994	100 000	1962	Books, dissertations, journals, online journals, articles from journals, old prints, grant reports	Cataloguing, Series, Loan Protocol, International Library Interloan Service
Institute for Postgraduate Medical Education	Rapid Library (Cosmotron s. r. o. – Czech Republic)	1995	7 000	1991	Books, periodicals, CD-ROMs	Acquisition, Cataloguing, Series, Loan Protocol
Institute for Clinical and	T-Series (formerly		4 000		Books	Cataloguing

Experimental Medicine	TINLIB - Electronic Online Systems International (EOSi) – the United Kingdom*					
Institute of Hematology and Blood Transfusion	T-Series see *		3000		Books	Cataloguing

On the basis of analyses and evaluations of the demands to be made on the system, the team arrived at three versions of the technical solution of the system.
1. a fully distributed system
2. a fully centralised system
3. a distributed system operated in central computer centres
The second version was chosen due to its functional, economic and technical advantages.

In the second and third years of implementation **(2001 – 2002)**, the **design phase** took place, in which the logical and physical system model was created (see fig.1 MEDVIK – System Architecture) and, at the same time, the software (DAWINCI – a Czech product) and hardware configuration (OS Unix, SUN Fire V880 server, Citrix MetaFrame Server – HP NetServer) was defined. The architecture of the system is three-tier (multi-tier) and consists of a data tier, an application tier and a user tier with a thin client.

The main criteria for selection of the software product were as follows:

- the philosophy and technical concept of the offered system
- support of standards (UNIMARC, MARC 21, Z 39.50)
- flexibility of the system
- user friendliness
- openness

The DAWINCI system was chosen as the basic foundament of MEDVIK. Reconstruction and development of this system will be completed by the end of the year 2002 when parametrization of the work processes of individual agendas (acquisition, cataloguing, loan system, search system, administration) are set.

With regard to the specificity of the MEDVIK system (an integrated system with mutually accounting relations, regulation of the flow of requests, etc.), a functional document delivery service module has also been designed and there is also an accounting service module, which is being developed and will also be completed by the end of the year. The chosen fully centralised system works with the UNIMARC structure by help of shared cataloguing and linking the holding information of individual institutions so that the records are accessible from a single database – the union catalogue. The chosen

DAWINCI LIS (library-informational system) allows for integrating a full-text search engine with the TOPIC Verity artificial intelligence as a superstructure.

The implementation and evaluation phase, along with conversion of the data of the involved institutions and the testing and verification of the operability of the system, will take place in **2003**, the last year of implementation of the project.

Results
When the LIS (library-informational systems) in use were analysed and evaluated to identify the system requirements in the first year of the project, the alternative consisting in creation of a fully centralised system, which would contain information on various types of documents in a single database and which would support work with authorities, thesauruses and dictionaries, was chosen for implementation of the project.

The central model will enable the cooperating institutions to carry out automation of all work processes directly in the central system, in which all the data will be stored.

It is estimated that the total number of records of the institutions implementing the project, stored in the system by the end of the year 2003, will be half a million. New records will be inputted into the system by using the principles of shared cataloguing, whose procedural rules will be prepared methodologically in 2003. The designed system, which is being developed, will allow for a morphological record on an inputted document being displayed to a user only once regardless of the number of multiple copies catalogued by the contributing institutions. The system will also enable a user to find immediately the holding information on the requested title and will offer the user the possibility of borrowing or blocking it.

Flexibility and openness of the MEDVIK system will allow for connecting additional libraries or other interested institutions through the Internet by using the server-client technology, without the need for creating its own technical infrastructure.

The implemented library standards (AACR2, UNIMARC, MARC 21, Dublin CORE) will ensure the possibility of connecting the MEDVIK system to national as well as international systems.

Conclusion

The first two years saw the project phases, in which the goals were set, the system requirements were identified by using an analysis and evaluation and, at present, we are finishing the design phase, the result of which is the logical and physical system model shown here (see fig. 1).

We will yet have to wait for final evaluation of success of the project until the end of the next year but after evaluation of the completed phases of the project, it can be said that the project will bring the following expected results:
-   a uniform internet interface
-   an equally working interface making it possible to have a real-time access from any point of the Internet to digitally processed information contained in the system as well as outside the system
-   access to integrated information sources via the portal http:// www.medvik.cz
-   providing orders, documents and services
-   sharing a single integrated database
-   compliance with librarian standards (AACR2, Dublin Core)

- creation of a uniform data processing methodology

A project of a similar scope has not been implemented in the Czech medical libraries in the last 15 years. Besides the gained experience with the technological solution, described herein, the works on the project have been a source of invaluable experience of teamwork, especially as concerns management of teamwork on designs in the following fields:
- the team formation process;
- selection of team members;
- the possibilities and limits of teamwork;
- advantages and disadvantages of making decisions in a team;
- team management;
- the ethics of decision-making.

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