

NETWORK MULTIMEDIA DATABASE ON STRUCTURE AND PROPERTIES OF LIQUID AND CRYSTALLINE METALS

Boris R. Gelchinski, Valery P. Beskachko, Dmitry N. Panov
e-mail: brg@sci.urc.ac.ru

Chelyabinsk center of Ural Branch of the Russian Academy of Sciences,
Southern Ural State University, Chelyabinsk

Network multimedia database (DB) on structure and physicochemical properties of liquid and solid metals, is a constituent of the wider project devoted making is informational - research systems (IRC) "Metal". Created by us IRS "Metal" is oriented to automation of routine operation and intensification of intellectual activity of the scientists working in field physics and chemistry of metal melts and inorganic materials. The System represents integrated medium functioning on the basis of the PC , on-line through a local network to the Unix server having an exit to the Internet.

There was a problem of a choice of an expedient of representation of system in the Internet and select of the relevant DBMS. From the server side the experts have a choice from two variants. The first and most trivial of them - to present a DB, in our case of records stored in IRS "METAL" as the usual hypertext manual. Just on this trajectory transmit the creators of system "Web Elements" at Cambridge University, Great Britain (see <http://tph.tuwien.ac.at/web-elements/web-elements-home.html>). Unfortunately, the sectional approach entails all of operation, incremental volume, on support and expansion of system. Other opportunity - arrangement of system joining an object-oriented DBMS, supporting a query language SQL, and the Web server through the gateway transparently compiling queries and the reports from one module in other and contrary. It means transformation of queries on the HTML language (HTML query) technology WWW in SQL inquiry and obtaining of the report as, suitable for transmission by Web server. From the client side the user has work with one of browsers, supporting the filled form CGI (Common Gateway Interface) and table. The second variant, certainly, is more flexible and is perspective, therefore and was selected by us as basic.

On the initial stage it was expedient to take advantage of free and/or conventionally by free (shareware) by yields, from which most attractively looks a DBMS Postgres 95, designed at Californian University, Berkeley. This DBMS is the rather powerful data base management system. It does not require special licensing and completely is free-of-charge. It gives system Postgres 95 huge advantages before many other similar DBMS. The system has most complete enumeration of properties, necessary for us, and is supplemented by the Wdb-p95 program - gateway server linking Postgres 95 with Web server. However, for development of the plan, the data structures of the database, in this system do not exist almost of not specialised software.

In this connection, we have accepted the solution to develop the basic principles of operation and construction of the data on a commercial DBMS Oracle 7, and then to transfer all on Postgres 95. Basically our design could be implemented completely on a DBMS Oracle 7, however high cost of the license and high requirements for used hardware and the software are make this variant less attractive to our concrete case.

At the first stage we designed the working model of our DB as the hypertext DB on the basis of a DBMS Oracle 7. For it the debugging HTTP daemon and modification of gateway servers, and also server, in particular for code conversion of figures of Cyrillic for records in Russian is released. Some applications permitting to the user - manager to fill the information fields in a DB are designed, and also to import necessary changes. For making network IRS integrating an object-oriented DBMS Oracle supporting the query language SQL, and of the Web server through the gateway transparently compiling inquiries and the reports from one module in the other and on the contrary will be released.

Now, at the second stage, we successfully have transferred all structures, and that mainest, data on a DBMS Postgres 95. The further filling of the database will be carried out through Postgres 95. The following important solution is a transition to usage of the Java language

in programs of a connecting level. The system can be presented as a three-level program complex: at the first level - DBMS, which realise storage, providing of access and data management. The second level is the Web server releasing data access through the Internet on HTTP protocol. Third, connecting, level - program of bond of DBMS and of the Web server, these programs are written on the Java language. In what essence of such approach? Java is the multiplatform language of a new generation. In turn, the DBMS Postgres 95, also works on set of platforms. And just for this reason there is a choice among set of platforms, and it improves a scalability and pliability of the design. For example, for development of programs of a connecting level IBM - compatible computer Pentium-133, with operating system Windows 95 is used. Then these programs are primly patterned on more powerful - Sun Ultra I and are used for system operation.

The network DB "Metal" is accessible to the Internet users by address:

<http://db-metals.sci.urc.ac.ru/index.html>

Scanning needs www-browser, such as Netscape Navigator, or Microsoft Internet Explorer. On initial page it is necessary to the user to pick the language (Russian or English) for operation with system. At a select of Russian there is an opportunity to place the coding system for scanning. The opportunity is submitiven to the user to pick from the table metal or alloy and to pass to their basic properties. As there is an information support of the database - it is possible to receive the extra information on the design, description of the database, detailed documentation about operation with the database, and extra references to world resources bound with properties of chemical elements. For convenience of search, all properties are systematised in a particular tree. The user, transferring from one knot of a tree to other, can receive all information, necessary for him, thus at any moment it is possible will change metal or alloy and to prolong scanning. The tree is organised so, those most frequently used properties are closer to a root of a tree that reduces a search time of the necessary property.

Frequently there is a problem of matching of any property for several metals. For it there is a powerful system of inquiries. In inquiry it is possible to specify, what metals, properties, parameters it is necessary to find and how to present the obtained data.

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