应用沉积学数据库进行图解式交流的连接

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在现代信息技术中，应用数据库进行交流存在着一个极为重要的问题，即用户的观点差异问题。为了能够应用信息系统进行交流，传统的系统要求用户具有专门的训练。这种专门训练往往是长期的，甚至必须具有良好的计算机基础知识和勤奋好学的性格。因此，无论这些信息系统多么先进和有益，上述原因足以使一些人望而却步，放弃使用计算机信息资源。

基于这一问题，贝尔格莱德大学矿业和地质学院开发了一个连接软件，它可弥补上述传统用户交流手段的不足。

本文介绍了这一软件的结构，即沉积学数据的录入方法和应用数据库进行图解式交流的连接软件的原理。

INTERFACE FOR GRAPHIC COMMUNICATION WITH DATABASES IN SEDIMENTOLOGY

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ABSTRACT

In modern information technologies, communication with databases represents of of the most significant problems from the user's standpoint. Conventional systems require special education of users in order to be enabled for communication with information systems. Some cases require a long-lasting education that should be preceded by well previous knowledge on computers and high animation of a user. These reasons are convincing enough for some persons to give up the usage of computer information resources regardless the advantages and benefits these systems offer.

Being aware of this problem, a software interface that eliminates the mentioned imperfections of conventional users communication approaches to information systems has been developed at the Faculty of Mining and Geology, University of Belgrade.

The structure, namely, the records of data base for sedimentology as well as the concept of

software interface for graphical communication with databasis bas been presented in this paper.

INTRODUCTION

At the Faculty of Mining and Geology, University of Belgrade, investigations covering development and application of computer information technologies have been performed for more than two decades. From the first efforts made concerning databasis formation, modest from the point of nowadays criteria, a long time has elapsed since creation of complex information systems such as a specialized system of scientific and technological information for Yugoslav mining and geology. Such approach originated from comprehension that information represent strategic resources and that the main precondition for successful progress of any modern scientific discipline is, in fact, the adequate approach to information resources.

All the above has been supported by computer technics and computer communications development (Concept C+C : computer+communication).

During a twenty-year period numerous geological and mining data-bases, different in purpose, organization and structure, have been developed at the Faculty of Mining and Geology of the Belgrade University.

Within the Project on development of geological information system of the Republic of Serbia, 1987—1988, the first databases concept for the needs of laboratory for sedimentology was established. Both the system of data restoring and organization of the databasis relies upon a classic numerical code and for this purpose a particular coordination system has been developed in this laboratory.

Having noticed, in general, the imperfections of these approaches that first and foremost are seen in both incommunicative and complex instruction of potential users, development of a new system named GRIN (Graphic Interface for Databases Management) was undertaken two years ago.

GRIN is based on hypertext and multimedial computer technologies with two main aims, the first of which is to enable the simplest possible communication between a user and computer and the second to create such a communication medium where databases creation and searching will depend on the user's professional but not computer knowledge.

RECORD OF SEDIMENTOLOGY DATABASES

In the Laboratory for sedimentology, at the Faculty of Mining and Geology of the Belgrade University, a structure, namely, a record for seismological databasis with heterogeneous, numerical, textural or combined formes has been defined.

Data integration within a record as well as the basis level has been derivated at the relation principle. The data that form a record are divided into three groups to make input

CLASTIC ROCKS SHEAT 1

LOCALITY:……

ROCK NAME:…… GEOLOGICAL UNIT:……

STRUCTURE:

Bedding—external:……

Thickness of the bed:……cm Azimuth:……Inclination:……Number of measurement:……

Bedding—internal:

Thickness of the laminae:……cm Azimuth:……Inclination:……Number of measurement:……

Structure—mechanical: Bottom:……

Paleocurrents:mean orient.:……Mean direc.:……Number of measurement:……

Top……

Ripples—wave index…… Number of measurement……

Chemical structure:…… Biogenic structure:……

TEXTURE:

Gramulometric analysis:

Coarse grain:……Medium:……Fine grain:……

Granulometric parameters:

Q1:……mm Q2:……mm Md:……mm P10:……mm P90:……mm

Sd:…… Sk:…… Kq:……

BIBLIOGRAPHY:……

SHEAT 2

MINERAL COMPONENTS

Allothigenic……

Authigenic……

Heavy:……

……

……

GROUNDBASSE:Cement:……Matrix:……Unidiferenciated……

DIAGENESIS

Diagentic changes:……

ENVIRONMENT

Depositional environment: Continental:……Marine:……Transition:……

DEPOSITIONAL PROCESS……

TECTONIC SETTING:…… Paleogeography:

……

SHETA 3

CHEMICAL ANALYSIS

$CaCO_3$:……% TiO_2:……% Al_2O_3:……% Fe_2O_3:……% FeO:……%

MnO:……% MgO:……% CaO:……% Na_2O:……% K_2O:……%

P_2O_5:……% CO_2:……% H_2O^+:……% H_2O^-:……% Cr_2O_3:……%

Total:……% Method of analysis:……

pH:…… Eh:……meV

TRACE ELEMENTS:

B: ……Be: ……Ga: ……Cr: ……V: ……

Nb: ……Mo: ……Ni: ……Co: ……Cu: ……

Zn: ……Mn: ……Zr: ……Sn: ……Sc: ……

Y: ……La:…… Sr:…… Pb:…… Ba:……

Ag:……Method of analysis……

PHISICAL PROPERTIES

Permaebility……cm/sec Porosity:……

Speciphic masses:……g/cm^3 Bulk density:……g/cm^3

ISOTOPIC ANALYSIS……PDB or SMOW

AGE

Stratigraphic…… Isotopic:……

COLOUR:……

Fig. 1 A detailed illustration of data record

data into the system easier. Such a division enables utilization of three standardized masks for data input through a monitor and a relatively simple logical control that provides input of syntactically correct data strucatures. The field lengths within a record vary and depend on type of data. A detailed data record is presented in Fig. 1.

The first group(mask)includes data on location, name of rock, data on geological unit, on original publication, data on texture and granulometric parameters.

The second group of data in one record refers to mineralogical composition, diagenetic processes, formation medium and chemical characteristics of rocks. Depending on rock name, the fields within a record are anticipated for allothigenes, autigenes and heavy minerals.

The third block consists of a set of data on trace elements, physical characteristics, isotopic compostion and colour.

CONCEPTION OF GRIN AND ITS CHARACTERISTICS

The GRIN software system represents a flexible graphic interface against databases, and at the same time the shell that control databases enabling their integration and connection with the image thus producing data visualization. Communication between the user and computer through GRIN can be realized by the mouse while communication between an image and databases can be realized through so called "bot points"i. e. by marker at the screen. These markers are in fact—small sensitive surfaces at the image through which a connection with databases is realized.

It is enough to simply indicate (by cursor)the particular marker(position or a field on the image, map or similar)and all the data connected with that position at the image will appear on screen. Thus, the user can read data from databases, make the input of data or delete the old ones.

In our case the map of the Republic of Serbia was designed and data from sedimentary databasis are connected with particular sections of territory. This procedure eliminates(x, y, z)the key for researching according to spatial criteria.

Simultaneously with this procedure another data approach possibility is anticipated . At any moment, the user can open a graphic menu at the screen where the keys for searching or performance of particular manipulation procedures have already been drawn or written. By setting a cursor at the field of the chosen key and pressing the key of the mouse, the user can perform the wanted operation.

Wishing GRIN to offer a complete convenience to the user, the third possibility of researching the databases by means of key words in conventional manner, has been anticipated. In this case, the user chooses the conventional searching option from the basic menu thus entering the programming modulus that others two inquires: one—searching through directly given key words and the other—indirect searching through the already established

dictionary of key words.

The GRIN software system is a flexible one regarding operations with different softwares for databases (dBase, Cliper, Excel , Oracle, Paradox, SQLBase, IBM DB2, Ingres etc.)and different screen size(PCX, WMF, TIF, GIF, BMP, TGA, EPS etc.)Both hardware and software requirements for GRIN correspond to the level of the PC platform under MS DOS operating system.

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