

COMPUTERIZED GUIDE FOR DECISION - MAKING IN EMERGENCY

Evgeny D. Vyazilov, Natalie V. Puzova, six, Korolyov Str, Obninsk, Kaluga region, 249020, Russia. Tel: (08439) 25676. Fax: (7) (095) 255-22-25
E-Mail: vjaz@storm.iasnet.com

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ABSTRACT

The idea of computer-based Guide creation is suggested. The contents and structure of such a Guide are developed. The research variant has been prepared for decision - makers in emergency. Within this framework the shell has been developed on MS-DOS basis that can be applied to any type of information.

1.Introduction

Organization and technical decision-making in emergency represents a special type of administrative activity. This activity is carried out under strong effect of nervous stress with acute shortage of time and limited information. Complicated interrelations of natural processes with production lead to unexpected consequences. Both wrong decision - making and the delay in correct decision - making would cost us lives and health of people, national and personal property. To decrease these consequences executives should make certain decisions for the preparation of which a demand arises for information from different, often with little in common fields of natural sciences and industries.

Decision - makers in emergency, having the authority and significant capacities and resources at their disposal, at the same time, as a rule, have no demanded special knowledge in the field of physics of natural phenomena, technological processes, terrain geography, transport capabilities, demographic peculiar features of a region and others.

Remoteness of provisional management points (head-quarters) from regularly active reference services, technical libraries and high- skilled advisers leads to additional difficulties for current analysis of situation and adequate decision - making.

At the same time as the description of objective difficulties in the work of decision - makers, one cannot but notice the creation of new resources of informatics, which have great importance in the light of problems considered. First, it should be noted that it is possible to locate large statistical data bases and knowledge bases on compact information carriers, used by personal computers. High effective software (information systems) of retrieval and information processing are also developed. Unification of these bases and software allows to create structured system on PC, usable in independent mode practically in any conditions, including the field ones .

Present information (computer) supply technologies of decision - makers, have certain shortages, associated with large volumes of dissimilar information, variety of the used software, computer types and data representation, table 1. While preparing decisions, decision - makers run into psychological, ergonomic and other difficulties, trying to use these or those information technologies. It is necessary to create systems of integrated data representation for decision-makers to eliminate such shortages.

Table 1

Various forms of data use and presentation in information systems

<i>Means</i>	<i>Type of means</i>	<i>Type of presentation</i>
Data	Numeric	Structured data bases : of space of time series
	Symbolic	Textual Documented: factographical bibliographical
Programs	Graphical	Maps, graphics, diagrams
	Textual editors	Lexicon, Word, Multi-Edit
	Data base Management System	Dbase, Oracl, FoxBase, FoxPro
	Electronic tables	Exel
	Publishing System	Venture Publisher
	Geoinformation System	MapInfo
	Expert System	Guru, Exys, Micyn
	Applied programs	
	Models	
Computers	Super computer	Syber, Crei
	Mini computer	VAX, Work stations
	Micro computer	IBM PC, Makintosh
	Compact computer	Note book, Lasptop

Systems of this kind are already being created abroad and in Russia. So, at the Conference ENVIROSOFT '94 two papers [1, 2] gave information on the creation of

integrated decision support systems, where it was expected to include dissimilar information into data bases, taking as an example a decision-maker, who controls the use of land in a municipal body. Computerized Guide is being developed at the All-Russian Scientific Research Institute for Hydrometeorological Information - World Data Center for a decision - maker controlling large volumes of data and for specialists, using hydrometeorological information for scientific investigations and designs. Within these investigations the shell has been developed on MS-DOS basis that can be applied to any type of information. This shell can be also used to create computerized Guide for a decision - maker.

2. Contents and structure of the computerized Guide

Before designing similar systems, it is necessary to determine the contents of information bases of such a system.

For information supply of decision-makers in emergency, data bases of physical-geographical, demographical, ecological and economical information, information about the degree of dependence of economics and ecology of a region from the environmental state are necessary as well as knowledge bases with effects and recommendations in succession and organizational - technical peculiarities of actions.

To computerized Guide is expected to include information on organizations, data bases, emergency cases and others, table 2. Table 3 shows the structure of information supply of the computerized Guide for a decision - maker for sectoral level of management. The Guide should be adapted to regions. The use of such data in Decision Support Systems (DSS), GIS or in models, included in DSS, allows to improve the work of decision - makers.

This information list does not include all information necessary for decision - makers. Such data bases are being created to solve this or that individual problem. In future these data bases can be included in the Guide. Information for such a Guide is mainly obtained from corresponding information systems, data bases and banks. They are only reflected in the Guide. The scheme of computerized Guide loading is given in fig 1.

To realize such data bases additional investigations and researches on their loading are required. Considering a large amount of information, necessary for decision - makers (ten - hundred of megabytes), it is more efficient to create such a Guide on compact optical disk (CD-ROM).

Table 2

Types and contents of files for computerized Guide with data information

<i>Textual file</i>	<i>Graphical file</i>	<i>Structurized file</i>
Information about : - international research organizations - bibliographic sources - data bases - software	<i>Reference information</i> Photographs of: - buildings - directors of institutes	Scientific information
Description of terrain, roads, populated are and other	<i>Cartographical information</i> Map, terrain plans, communications Information on hazardous objects Photographs of: - objects - results of standard emergency	Information about hazardous objects Statistical evidence on emergencies
Dams, chemical plants, atomic stations, pipelines, inflammable objects	<i>Information on emergency</i> Photographs of: - results of standard emergency	Information on populated areas, enterprises
Natural disasters: - hurricanes, mudflows, earthquakes, floods Ecological Technogenic		

Table 3

The structure of information on Guide provision for the reference service

<i>Informational blocks</i>	<i>Subblocks</i>	<i>Menu</i>
Informational about organization	International National	UNDRO, UNEP, WMO, IOC Society, agency, research institutes (RIHMI, SIAE)
Information's on data sources	Observational networks	Meteorological, oceanic
Data bases	Environmental (atmosphere, oceans, rivers, earth, lakes)	Organizations AARI, RIHMI
	Ecological (water, air, soil pollution, on accident)	SIAE, IEM, MGO
Bibliography	Journals, bulletin, monthly reviews, annual reviews	Names papers
Information about of hazardous objects	Disturbing: inflammable, atomic hydroelectrical stations	Names objects
Information about populated areas	Towns, settlements	Names
Information's on emergencies objects	Most and less liable	Names objects
Emergency data	Technogenic, natural, ecological	Transport, fires, explosions and etc.
Statistical emergency data	Technogenic, natural, ecological	For the whole period by types of emergency

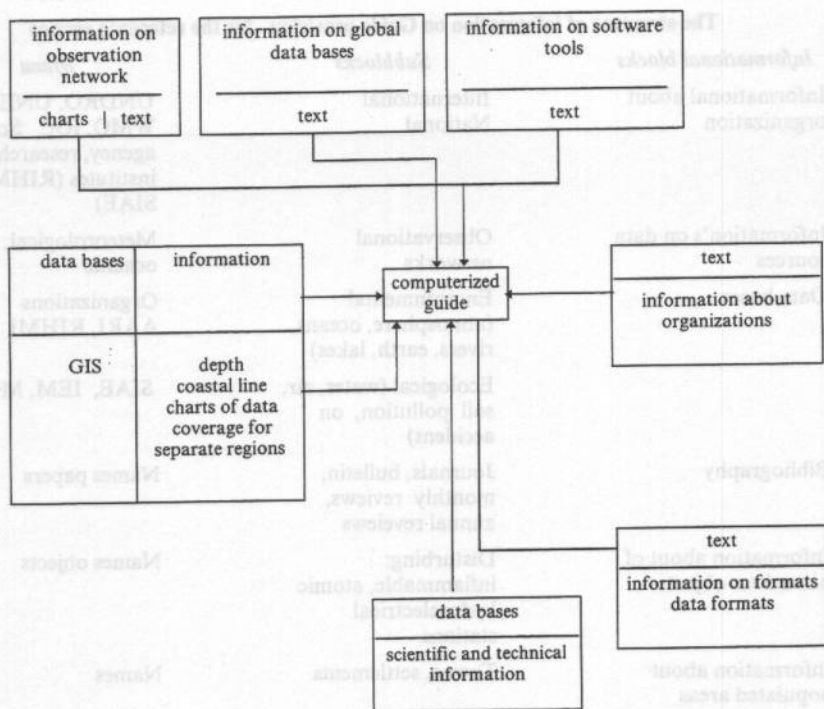


Fig 1. The scheme of computerized Guide loading

3. Software tools designed for computerized Guide

The computerized Guide is meant for fast and simple search of information needed, which is given arsenic text files, tables, graphical files, etc. The system is operating in graphical mode using monitor enhanced graphics adapter EGA/VGA, "mouse" or a keyboard.

The Guide allows to choose information, get additional information for interpretation of tables or schemes chosen; visual presentation of information within the created catalogues is also possible.

The Guide data base contains files with tables and figures with extended *.txt, *.pcx, files of catalogues for every block with extended *.ct and files with description of tables and enlarged information on the composition of the corresponding table or figure with extended

*.inf. Each information block is related to the separate catalogue in the data base and the pictograph in the main menu. Each string of the catalogue describes one information file, - file containing table, scheme, figure or photography.

The Guide application reduces to the following main steps: the system loading, working with a Guide and the arsenic well arsenic maintaining the data base. The user chooses the block information on data, formats, software tools, etc.), designates subblock. Then the necessary information from the catalogue is chosen, according to which the data are displayed on the screen. Information can be retrieved both in the catalogue and a separated line. The research region is set by the chosen scheme and it can be changed with the help of "telescope". The data catalogue displayed on the screen shows the names of information types, agencies, etc.

The main menu of the Guide reflects pictographs related to research sections whose catalogues are at the moment in the data base arsenic well arsenic the map of the region.

In the lower left corner such pictographs are given:

- TRANSITION TO THE DOS - interrupt the work with the system;
- CHANGE OF MAP - to jump to the catalogue with maps a choose one of them;
- PROMPTING - prompting can be called at any moment of work with the system using the given pictograph or key F1.

Scanning the Guide one may use the following instructions:

- ONLY THE REGION/ALL CARDS - switch to the list of all names of the catalogue or only names satisfying the set region;
- SELECTION - change of the selected subblocks;
- SEARCH - set of searching mask in the catalogue;
- EXIT - return to the main menu.

Mask of data search contains the following fields:

- CARD 'S NAME - name of catalogue;
- REGION' S COORDINATES - the coordinates of the region you are interested in;
- TYPE CODE - the code of information type;
- TYPE OF FILE - tables, text or PCX - file;
- NAME OF CORRESPONDING FILE - the name of the needed file.

In data base accessioning mode the main menu gives pictographs related to every research section. When access to the block is made that has no catalogue, the request for its creation is displayed on the screen. After that you can fill the new catalogue with information needed. The new commands are added in the work with the catalogue:

- ADDITION - creation a new name in the catalogue;
- CLEARANCE - after the catalogue is created this command is used to remove erroneous and suspected records.

To make the Guide more flexible and adjust it to the specific user the file of initialization is created, whose application allows to change the menu where it is necessary, removing or adding pictographs, setting the type codes, etc.

4. Conclusion

The idea of computerized Guide creation is proposed. The composition and structure of the Guide are developed. The pilot version of the Guide is created for the decision - maker for emergency and project works on the basis of MS-DOS system with a "mouse". Within the framework of these studies the "shell" for working in MS-DOS has been developed.

To realize such Guide extra studies are needed and great work on data bases loading. Considering a host of data (tens - hundreds of megabytes) it is expedient to create such a Guide in the future on a compact disk (CD-ROM).

It is evident that updating all information blocks of the system is impossible using the efforts of only programmers, developing the system and specialists of one country.

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