APPLICATION TROUBLESHOOTING OF STORAGE AND MANAGEMENT OF WATER RESOURCES

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Abstract - Implementation of new application software systems to modernize the control of water resources represents one of the most cost effective solution to access data related to leads. The detailed processing of the data analysis can be improved and the water monitoring. The need for detailed monitoring, supervision of water resources, access to application field, would serve in the work of state and municipal institutions. That information system for water resources management (ITWR) offers all this. With the help of software analysis using methods statistically analyzed water bodies, all data have been entered in the database from which the calculated water consumption and utilization of water resources. With the help of computer information system for water management and water resources would enable an easier way to access, exchange and access to information. Timely access to data, monitoring of water levels and the prevention of natural disasters represent an incentive for the creation of a large database in which to store all relevant information and data related to water. The database and its connection with new computer systems and applications can easily provide timely access to data and saving money.

I. INTRODUCTION

With the development of technology and the use of new methodologies for data exchange, there is the need to use a system whose assistance would allow easier access, use and download the information (data).
This project will be explained the information system used to manage water resources (ITWR).

What is the need of using such IT system?
The utilization of water resources and water is a daily basis, both in households at work, in school faculty. Growing water demand represents an additional incentive for the creation of an information system that would oversee current state of water resources.

A. The use of water resources in Macedonia

Macedonia has a huge potential for the proper and efficient use of water resources, environmental protection and thus improve the living way in the country. By applying new methods and systems already in use in countries around the world could improve the current situation which is not encouraging. Large challenges offered water area and water resources constitute an incentive for all municipalities and centers that are part of this country as well as a number of professional teams working in this area.

All municipal centers in this country receive greater responsibilities and greater powers for monitoring and analyzing water potentials and resources. This represents a great opportunity for the implementation of new projects in the water and faster implementation of activities related to the environment and its pollution.

By following the world standards and criteria, Macedonia can save a lot of water resources and water especially in summer dry periods when browsing the water is much higher than a search, which all users would have to lower costs in terms of consumption and utilization.

Restoration of water resources and their use is also one of the key processes that would improve the life cycle in this country. Of course, there are and other sources of energy associated with water, which should be further examined and analyzed. By using modern application systems improves the current state of water resources and the control and exploitation of the waters.

B. Water and water resources in Macedonia

Implementation of new application software systems to modernize the control of water resources represents one of the most cost effective solution to access data related to leads. The detailed processing of the data analysis can be improved and the water monitoring. The need for detailed monitoring, supervision of water resources, access to application field, would serve in the work of state and municipal institutions. That information system for water resources management (ITWR) offers all this.

The emergence of a large number of expenses that occur during data collection, their approach is

necessary to find a solution that would be viable for a longer period of time. The goal is to implement an information system that would be received detailed, timely and accurate results for a more efficient operation and proper utilization of water resources.

Implementation of the Information system for managing water resources based on the following objectives:

- Providing accurate field data;

- Reducing the time period for receiving data;

- Database that will enable easy and timely access to data;

- Greater protection of data;

- Identification of data access;

- Video surveillance of critical points of water bodies and artificial reservoirs;

- Using applications for download, typing and data recovery in fieldwork;

- Saving time, financial resources and easy distribution of data across the country.

With the help of software analysis using statistical methods are analyzed bodies in Macedonia, all data have been entered in the database from which the calculated water consumption and utilization of water resources.

Rivers which are mostly used as bodies in this state will be divided into several parts in order to make them more detailed analysis. Water bodies are not fully utilized in all parts of identifying areas so with this statistical analysis are getting more and more reliable data.

C. Objectives of the project

Timely and correct implementation of the information system for water resources management (ITWR) need to set goals to be realized the specified time period. The objectives of this project are shown in the next section.

1) Preparation Phase
In the initial phase of the study are presented data that will be used to display the current field situation and the need for a system that this job would be simpler. It is this data analysis and statistical analysis would show or model that would be easy to use and will monitor very big deal.

2) Maintenance of documentation and data
By analyzing the data received documentation that could be quite important for the institutions of this

country. This documentation contains all the documents required to create a huge database, and the creation of an information system.

3) Creation of an information system for water resources management
With the help of computer information system for water management and water resources would enable an easier way to access, exchange and access to information. Timely access to data, monitoring of water levels and the prevention of natural disasters represent an incentive for the creation of a large database in which to store all relevant information and data related to water. The database and its connection with new computer systems and applications can easily provide timely access to data and saving money.

Why monitoring water using a computer system?
Need water every day is greater. This is not only water that is used in everyday use (households, schools, state institutions, etc.). Using the detected position in the distribution of water can easily find the problem and eliminate the lower interval if using applications related to computer systems. Also with the help of mobile phones can be controlled distribution of water for irrigation. Conserving water in dry periods and implementation of drip irrigation system is an additional incentive for the application of this kind of coordination and control of data.

Locations in the country with specific access and difficult accessibility

Certain locations in the country (Macedonia) would certainly preached difficult problem of providing access to the database and the utilization of information system online. Yet in much of the whole territory is available for monitoring and timely upload of data from the spot. The locations of which can be difficult to obtain online data will also be part of the monitoring but attaching data will be achieved by any other method.

D. Implementation of the system

The stages of project implementation using the information system for the control of water resources are as follows:

- Collecting data - gathering data from all state institutions and municipal addition to database;
- Amendment and verification of the database - The collection of all data related to water and water resources on the territory of the whole state, monitors the process of amending the database;

- Maintenance of data and their recovery - All data will be collected from different institutions which are registered in the database need to be sustainable, available and applicable. The data obtained from monitoring on the ground must be entered which means that you have to run the data recovery;

- Computer system for management of water resources - By defining the database can be started by connecting the computer system and all state institutions that need information. The need for data can be provided online, with exactly this system and all the information of the activities from the field can be inserted from the spot.

The use of new technologies in the IT sector contributes to:

1. Lower consumption of finance and time, going from institution to institution, writing letters, waiting for requests etc;

2. Increased efficiency of data obtained from the scene, their greater probability and write properly in base and their power for immediate modification (change);

3. Rational use of water and equitable distribution of water;

4. Enhanced lifespan and timely information to citizens in the field of water;

5. Controlling and monitoring the irrigation system, release of accumulations control monitoring points by placing a video monitor and easy timely intervention;

6. Timely detection of problems in the operation of the system;

7. Use of different technologies and systems for saving water resources and spill and accumulations.

8. Education and learning farmers using new systems for the collection and control of the water resources.

II. PROPOSAL FOR PRESERVATION PROGRAM BASED ON DATA

SPSS 19 software package offers many possibilities for data processing, their analysis, comparison, display and preservation. In this part of the project will be displayed appearance of SPSS 19 and all its features.

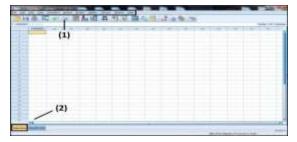The look of the SPSS 19 e shown in the following figure:

Figure 1. SPSS 19 display the main menu

The picture number 1 shows the main menu of the SPSS 19, while the number 2 is designated Data View. The main menu consists of several submenus as follows:

- File menu - menu with two data we able to create SPSS File (document), the possibility of opening a document reading variables from the database and their display, reading and display the ASCII data file, saving, printing the output of processing data and save them (save);

- Edit menu - Cut (move data), Copy (copy), Paste (insert), Modify (change data), Copy Charts (copying diagrams);

- View menu - Turn off tools (toolbars), display tools and their use (or not included) controlling the values embedded in the table;

- Data menu - In this menu you can change the data copied and to change their characteristics, values, sizes, also arranged classes and variables, using and define the methods of analysis;

- Transform menu - menu offers us an opportunity to change the data and the variables that we have selected, a window display with date and time, use the clock cycle of the data (series);

- Analyze menu - Data analysis is one of the biggest features of SPSS 19. Therefor this menu offers that option. The menu offers the following options: cross tabulation, forecasting, analysis of variance, correlation, linear regression, factor analysis;

- Graphs menu - SPSS 19 offers the option to display the possible solution as an image (graphic). Using the chart as the output display resolution the user can detect and perceive the difference and comparison of data. Here we are offered several types of charts that can be used as follows: bar charts, pie graphs, histograms, scatterplots, full-color and high-resolution graphs;

- Utilities menu - Display of information and variables are processed, control variables and all the windows used for the analysis, change of syntax;

- Add-ons menu - Review of what is used in the analysis of data;

- Window menu - Minimizing windows and their use and

- Help menu - Help menu of the SPSS19th users.

In the Data View are entered variables are analyzed and processed. Except field data view, there is another option for consideration of the detailed characteristics of the data that would be imported. In this field are given all the commands needed to use the data and processing.

Data can be of different types and have different sizes or other display output. Option to display variables (variable view) is shown in the figure below.

Figure 2. SPSS19 assignment of variables and their features

- Name - This column can change the name of the variable. Example (Macedonia 1). The name can contain special characters such as /, *, and $. The data should not be launched with a number. Otherwise if you want to enter the number as initial value, we receive information that is not possible;

- Type - Defining the type of data that is entered in the column. What type of characters used (strings, characters, numbers). It determines what type of data is analyzed and processed;

- Width - Change the number of digits that can be displayed in the column;

- Decimals - let's change the decimal places of any numerical data. Define how many decimals may appear in column number, thereby defining and the accuracy of the data and its expression;

- Label - A detailed description of the data and explaining their characteristics. They

can be given commands us to explain that such data and what significance they have;

- Values - Explanation of data with text. All data set number can be defined by text;

- Missing - Define the type of data that should be missing (not shown in figure) of output;

- Columns - The width of the column to display the list of data can be set using the control columns;

- Aligin – Correspondence of data (text or numbers) and

- Measure - Determining the type of data processing.

A. *Displaying Database (attribute table)*

Figure 3. attribute table rivers of geographical database

In this part of the project shows the geographic database of rivers in Macedonia. The attribute table can be supplemented and amended. The data used in the table are the following:

1) Name - This field stores the name of the water body in this case - the name of the river.

2) River Basin - a field in which is stored the river basin which belongs to that river. In the example used the following river basins: the Amazon, La Plata and Boca.

3) Length - The length of each river is shown in this field (in kilometers).

4) Geology - Geology of each water body numbered according to the type of water body (channels have a body type 0 - no geology in them).

5) IT - code database, the rivers are indicated with 100, 200 lakes etc.

6) WB Type - This section splits the water bodies. 1 used rivers 2 used lakes and 3 are used for irrigation canals.

7) City - The total number of cities through which the water body is shown in this column.

8) Monitoring - All monitoring stations set up on water bodies and their sum is stored in the circuits of geo base.

9) Video - The need for video surveillance is required so there is an option for its use.

10) GIS - Code that is used to distinguish the geology of the bodies. Ex R1127 was used as a source of a river, L1130 was used as a source of Lake CH1143 used as a code channel irrigation.

All these explanations also apply to databases of lakes and canals irrigation to be displayed in the next few pages. Of course the database is defined with those attributes but will further complements.

Name	Il Basin	Length	Geology	IT	Type	City	Monitoring	Video	GIS
Pyrex	Albania	100	4	402	2	2	2	No	L1129
Seine	Huertha	221	4	403	2	2	1	No	L1130
Usui	Huertha	214	1	404	2	1	2	No	L1131
Rogue	Huertha	115	3	405	2	1	2	No	L1132
Guachache	Huertha	100	2	406	2	2	1	No	L1133
Humaida	Yucca	54	2	407	2	1	3	No	L1134
El Cisesno	Yucca	44	1	408	2	1	3	No	L1135
De Canas	Coco	34	1	409	2	3	2	No	L1136
Luckaty	Coco	77	2	410	2	3	2	No	L1137

Figure 4 . Attribute Table for ponds from a geographical database

Name	Il Basin	Length	Geology	IT	Type	City	Monitoring	Video	GIS
Santa Cruz	Amazon	8	0	501	3	3	2	No	L1129
La Paz	Amazon	3	0	502	3	4	2	No	L1130
Sucre	La Plata	3	0	503	3	2	2	No	L1131
Jacuba	La Plata	3	0	504	3	2	2	No	L1132
Rio Sio	Boca	2	0	505	3	1	2	No	L1133

Figure 5. Attribute Table for irrigation channels from a geographical database

III. Conclusion

The need for detailed monitoring, supervision of water resources, access to application field, would serve in the work of state and municipal institutions. That information system for water resources management (ITWR) offers all this. With the help of software analysis using methods statistically analyzed water bodies, all data have been entered in the database from which the calculated water consumption and utilization of water resources. With the help of computer information system for water management and water resources would enable an easier way to access, exchange and access to information. Timely access to data, monitoring of water levels and the prevention of natural disasters represent an incentive for the creation of a large database in which to store all relevant information and data related to water.

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