



Development of a graphical user interface (GUI) application for the management of borehole data

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Before undertaking any design work for a civil engineering project, engineers must have full information about the earth material on which the structure is to be founded, constructed with, or in which the construction is to be carried out.

Data from borehole investigation in the preliminary stage of the project is essential providing the necessary information for the next stage of designing and later on evaluating the expected values of soil and rock properties in the wider area of the project.

The need to provide data and management capabilities both to geologists and other scientists of different disciplines makes it vital to visualize the data in a more understanding way, through a reliable software package. In addition, improvements in computer science, both hardware and software, have created an opportunity to rethink the manner in which such data is archived and presented.

In this paper, the development of a specific GUI application is proposed to access geological structure and soil and rock mechanical characteristics, based on borehole data. The application has a graphical interface and has been developed with the use of Visual Basic 6.0, a third – generation event driven programming language. The relational borehole geological and geotechnical database which is embodied in the application is connected by SQL connection to it. It is implemented on the Microsoft Jet Engine, storing data in Microsoft Access Database, guarding an easy access, management and updating of data.

The database has a specific structure which ensures the valid input of spatial and attribute data, but also available laboratory testing data. In particular it provides a plan view of the locations of the boreholes, logs of the executed boreholes, cross - sections and the available photos. It also contains laboratory soil and rock tests which have been performed. The application has the ability to adjust the input data to the nature of the sample (soil-rock), the sampling procedure and the scope of the investigation. It also can define areas of interest for data clipping and export, linking boreholes to their corresponding 2D log graphics, cross sections, and available soil and rock tests. It's capable to perform statistical analysis of the input data and present the results in user friendly form.

The solution presented is illustrated with an example from field practice testifying to be a useful tool for management and presentation of geological and geotechnical borehole data, to any civil engineering project.