

APPLICATION SOFTWARE *PREV* FOR PROJECT EVALUATION – OUTPUT MODULE (*PREV-out*)

Summary

In this article is processed the next part of application software concerning calculated results presentation. Even excellent mechanism of calculation can't be practically used without first-quality output information. These data can be presented in a basic numerical or in broadened graphic form.

Field of application

After the completion of the second (calculation) stage of the research, further areas of the *PREV* application can be offered. Current stage – output modulus – will help to define further application of the software. The output information allows to use *PREV* in the evaluation of projects and design variants (material, constructional, economic solutions etc.), see Figure No. 1. A part of the evaluation process in the criteria structure, which is shown in the Figure No. 1.

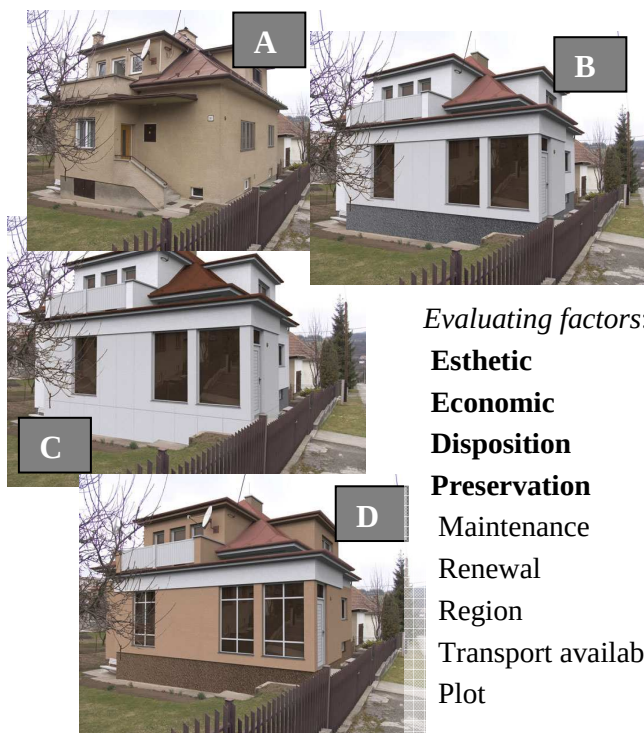


Figure No. 1 Evaluation of the project variants (material, constructional).

Methodological and conceptual approach

The basic solution consists in three single sequential steps. Each step is independent and is based on the results of the previous step. The matter concerns the following three modules:

1. *PREV-in*: module for basic calculating structure creation,
2. *PREV-solve*: calculating module for processing of input data structure,
3. *PREV-out*: output module for numerical results processing.

Basic data structure is created in *PREV-in* module. Then follows the calculating module *PREV-solve*, which processes the input data and provides final results simulation. At this stage a technique similar to the simulating tool *Dynamic Harmonogram* (Beran a kol, 2002) or simulating software *FREET* (Novák, Vořechovský 2003) is used. Software *PREV* differs in the following: the *PREV* is an open system developed in a spreadsheet. Any user of spreadsheet (*PREV*) can arrange his own software environment. There are no limitations of closed version of commercial software.

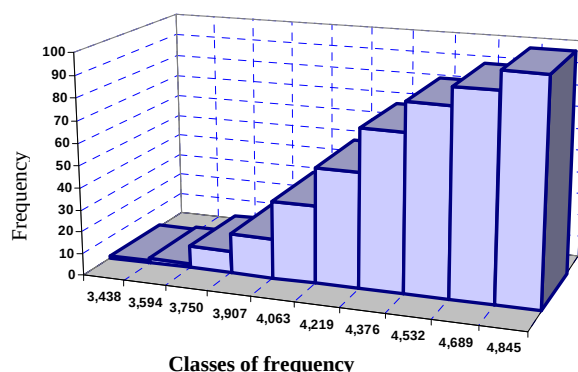


Figure No. 1a Graphic presentation of 3D distribution function.

The similar feature of open system also offers e.g. simulating tool *GRAC* (Dlask, 2007). At the final step by using *PREV-out* module numerical results

are separated and transferred to one point (in this case, to the sheet of the MS Excel). From this point necessary data are chosen for the graphic presentation.

The Figure No. 1 presents basic output of distribution function resulting from the simulated values for the final project evaluation. Besides the space (3D) presentation, also 2D graphic presentation of distribution curves can be created. The results can be received at each level of the criteria tree (see Figure No. 2).

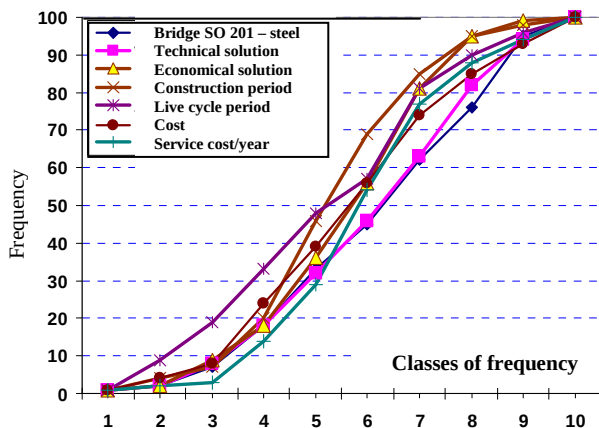


Figure No. 2 Distribution functions (2D) for all evaluated levels.

In the extended output variant it is possible to depict distribution functions as a space (3D) presentation. In such a way proportional differences between separate functions can be seen (Figure No. 3).

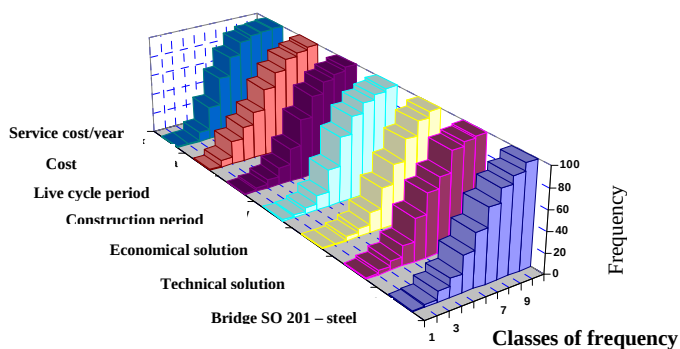


Figure No. 3 Distribution functions for all evaluated levels in 3D presentation.

The incidence frequency and corresponding distribution function can be presented for the interval of values between global minimum and global maximum $\langle Min_{glob}, Max_{glob} \rangle$ or else within the framework of the concrete simulated values of the selected parameter at the selected level $\langle Min_{ij,loc}, Max_{ij,loc} \rangle$.

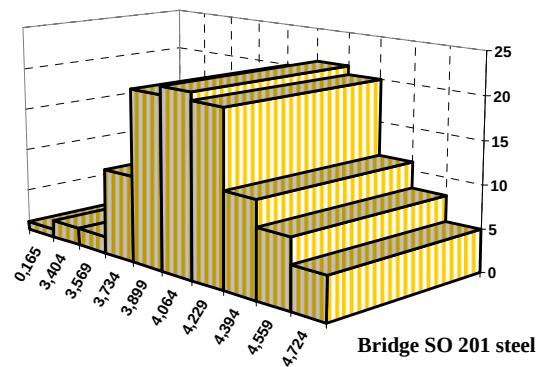


Figure No. 4 The graphic presentation of simulated frequencies in 3D graph.

Research results

The numerical results provide the data for graphic outputs. Graphical presentations give additional information about the evaluated project. Thus the final project evaluation will be obtained, as well as the evaluation on single levels (single part evaluation, so-called *partial evaluation*). The basic outputs are frequency of the simulated values, their cumulated variant and standard distribution function. In addition to the evaluation (final, partial), an integral part of the results is the information about its reliability.

References

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- Novák D., Vořechovský M., Rusina R. Small-sample probabilistic assessment - FREET software. In A. Der Kiureghian, S. Madanat, and J. M. Pestana, editors, ICASP 9, International Conference on Applications of Statistics and Probability in Civil Engineering, held in San Francisco, USA, pages 91-96, Rotterdam, Netherlands, 2003. Millpress.
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