



## **New Age of 3D Geological Modelling or Complexity is not an Issue Anymore**

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Geological model has a significant value in almost all types of researches related to regional mapping, geodynamics and especially to structural and resource geology of mineral deposits. Well-developed geological model must take into account all vital features of modelling object without over-simplification and also should adequately represent the interpretation of the geologist.

In recent years with the gradual exhaustion deposits with relatively simple morphology geologists from all over the world are faced with the necessity of building the representative models for more and more structurally complex objects. Meanwhile, the amount of tools used for that has not significantly changed in the last two-three decades.

The most widespread method of wireframe geological modelling now was developed in 1990s and is fully based on engineering design set of instruments (so-called CAD). Strings and polygons representing the section-based interpretation are being used as an intermediate step in the process of wireframes generation. Despite of significant time required for this type of modelling, it still can provide sufficient results for simple and medium-complexity geological objects. However, with the increasing complexity more and more vital features of the deposit are being sacrificed because of fundamental inability (or much greater time required for modelling) of CAD-based explicit techniques to develop the wireframes of the appropriate complexity.

At the same time alternative technology which is not based on sectional approach and which uses the fundamentally different mathematical algorithms is being actively developed in the variety of other disciplines: medicine, advanced industrial design, game and cinema industry. In the recent years this implicit technology started to being developed for geological modelling purpose and nowadays it is represented by very powerful set of tools that has been integrated in almost all major commercial software packages.

Implicit modelling allows to develop geological models that really correspond with complicated geological reality. Models can include fault blocking, complex structural trends and folding; can be based on excessive input dataset (like lots of drilling on the mining stage) or, on the other hand, on a quite few drillholes intersections with significant input from geological interpretation of the deposit. In any case implicit modelling, if is used correctly, allows to incorporate the whole batch of geological data and relatively quickly get the easily adjustable, flexible and robust geological wireframes that can be used as a reliable foundation on the following stages of geological investigations.

In SRK practice nowadays almost all the wireframe models used for structural and resource geology are developed with implicit modelling tools which significantly increased the speed and quality of geological modelling.