Geologist, work with your geomodeller to ensure your sedimentological interpretation is properly taken into account in the geomodel

Thomas Jerome, P. Geo., P.M.P.
GMDK Inc. (www.gmdk.ca)

Summary

Geomodels are three-dimensional (3D) representations of the rock characteristics of the reservoir. Geomodels are the visual presentation of the interpretation that the asset team made of the reservoir (Figure 1). In practice, geomodels need data provided by the geoscientists (geologist, petrophysicist, geophysicist) and by the engineers (flow simulation engineers mostly). These data might be well tops, seismic interpretation, facies description along the cored wells or concept of connection between the producers and the injectors for example.

A challenge for geologists is that a large part of their knowledge about the reservoir is not represented in these simple forms of data. Their main geological input is the overall vision that they have built of the reservoir by combining the data with general geological concepts of deposition and deformation, with regional geological concepts and with knowledge gained from geological analogues. This overall vision might be expressed in contour maps, manually drawn cross-sections or it might even only live in the mind of the geologist.

The problem becomes how do we transfer the whole geological vision of the reservoir into the geomodel. Through constant communication and experience, good geomodellers will know how to integrate all that knowledge. More data-driven geomodellers might prefer instead to focus only on the data, on the assumption that the "raw" data are more unbiased than the geologist's vision. At the end of the day, the geologist is dependent on the skills and the mindset of his geomodeller to get a geomodel built which respects – or doesn't respect – his/her ideas about the geology of the reservoir.

This presentation is a review of the many steps of the geomodelling workflow which can be connected back to specific geological concepts (Figure 2). As a consequence, it is the belief of the presenter that these geomodelling processes must be run taking the geology into account.

This presentation is tailored to geologists working in teams in which someone else will do the geomodel. It is also aimed at beginner geomodellers and at geomodellers who tend to build data-driven models. Through this review, the geologists will have some ideas of where he/she can influence the geomodelling process. And the geomodellers will have some ideas at what to ask to the geologists. It is the hope of the presenter that such a presentation can help building bridges between geomodellers and geologists.
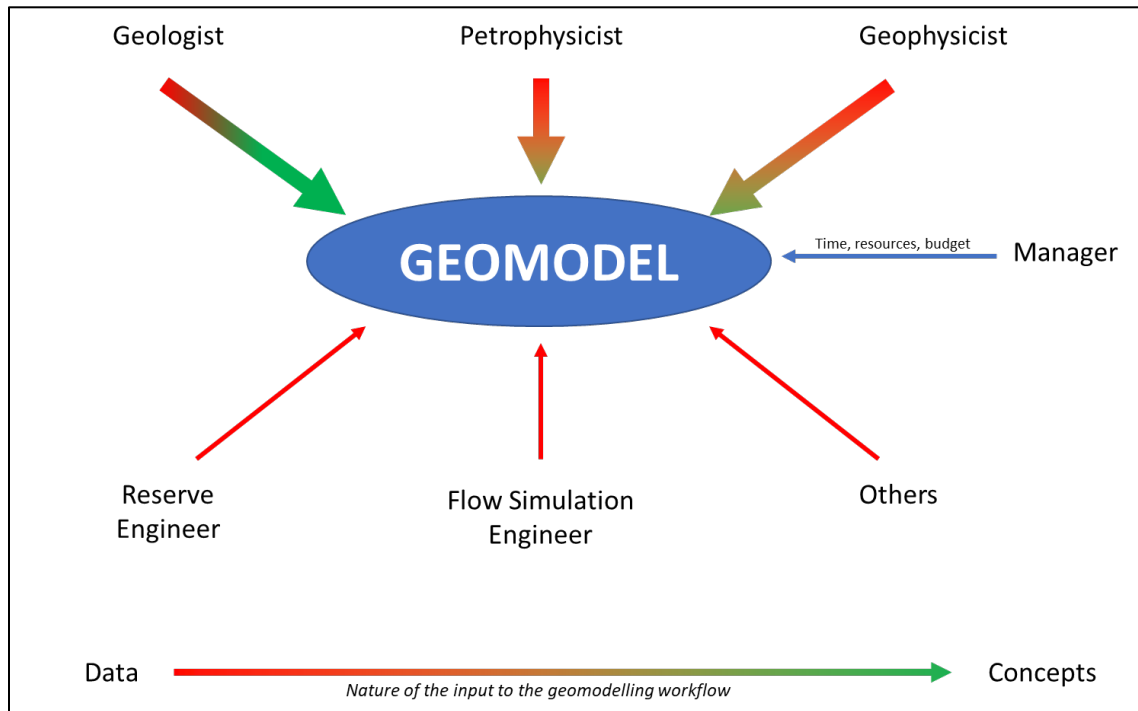
Figure 1. Type of input to a geomodelling project, from data to concepts
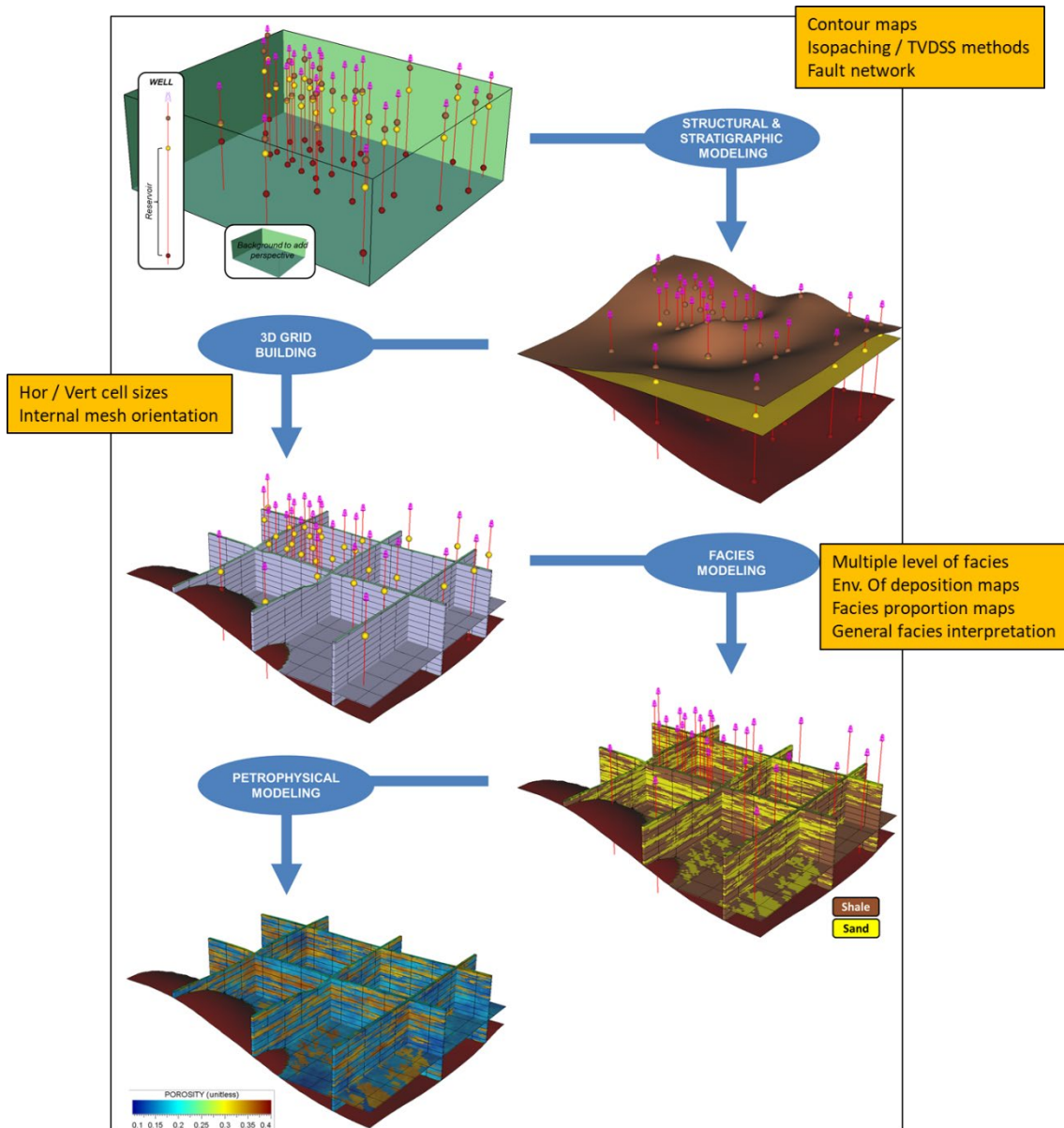
Figure 2. Geomodelling decisions (orange boxes) influenced by geological interpretation (non-exhaustive).