

## A CRITICAL REVIEW OF ROCK TYPING APPROACHES IN CLASTIC RESERVOIRS

### Abstract:

Rock typing is a process of classifying reservoir rock into distinct units based on various subsurface data including core, logs, and production performance. The rock types with unique set of characteristics being used in reservoir model to distribute the petrophysical properties. Over the years, various approaches of rock types have been developed by various companies according to reservoirs, lithology, locations, and company preferences. The objective of this paper is to critically review some of the most common rocktyping approaches in clastic reservoirs and highlight their limitations and uncertainties.

Various approach being used in industry for rock typing in clastic reservoir. From simple Vshale cutoff to more advance Artificial Neural Network (ANN) or Self Organizing Map (SOM) is common to cluster the reservoir to describe the poro-perm relationship, Saturation Height Function (SHF) model and relative permeability correlations. Although commonly used in reservoir model, there are significant pitfalls in rock type approach that often overlooked intentionally to simplify the process, to expediate modelling workflow and due to lack of alternate approach. The observation from various field studies is summarized in this paper with the examples. Most common issue observed are related to the reconciliation of various rock typing approaches from various scales of data from various disciplines (sedimentologist, geologist, petrophysicist, etc). Another major issue is related to the application of the rock type to establish various correlation which often ignore statistical challenges related to averaging and regression.

Case studies from field examples were analyzed and the observation were captured. The lesson learned from these case studies has been used to enhance the current rock typing workflow using integrated approach with collaboration from various discipline. In addition, an out of box approach with the concept of infinite rock type modelling will be proposed as alternative to establish robust petrophysical property model.

### Bio:



**Thanapala Singam** is a Custodian Petrophysicist in Petroleum Engineering Department, PETRONAS with 19 years of experience in petrophysics. He has worked in various aspects of petrophysics including logging operations, integrated formation evaluation, recourse assessment and reservoir modelling in clastics, carbonate and basement reservoirs. He is Discipline Resource Person and Group Technical Authority for Petrophysics in PETRONAS. Besides he is also Subject Matter Expert (SME) for Integrated Reservoir Characterization and Thin Bed Analysis. He has Bachelor of Petroleum Engineering (Hons) from Universiti Teknologi

Malaysia.