Project Proposal for Reservoir Compartment Prediction, *an Integrated Approach based on Well Evaluations, Seismic Interpretation, Attribute Extraction, Seismic Geostatistical Inversion and Reservoir Characterization*

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1. **Seismic Interpretation**:
   - Seismic horizons interpretation & picking
   - Correlate well tops to seismic horizons and generate time-to-depth relationship for individual wells.
   - Unified seismic interpretation and geological modeling for target layers
   - Identifying and mapping all major faults, unconformity etc.
   - Detailed seismic structural mapping of target layers

2. **Well evaluations**
   - Well evaluations to calculate porosity, volume of shale, etc.
   - Gross sand/net sand evaluations from wells
   - Well-to-well correlation

3. **Seismic post-stack attribute analysis**
   - Spectral Decomposition to decompose post-stack seismic dataset into time-frequency panel through an implementation of Match-Pursuit Wigner-Ville Distribution(WVD), which can be applied to detect the dispersion anomalies associated with gas saturation
   - Seismic instantaneous attributes
   - Generating hybrid attribute which is a combination of the optimum set of attributes.

4. **Seismic pre-stack attribute analysis**
   - Attributes extraction from AVO/AVA gathers based on least square fitting
   - Attributes extraction from CDP gathers based on Radon Transform (hyperbolic/parabolic)
   - Generating hybrid attribute which is a combination of the optimum set of attributes.

5. **Seismic facies analysis (if no wells)**
   - Seismic facies analysis based on 3D multi-attribute volume classification using self-organization neural network.

6. **Seismic geostatistical inversion analysis (if few and more wells available)**
   - Support Vector Machine (SVM) training to build the bridges among seismic hybrid attributes and well property, such as porosity, water saturation and volume of shale.

- Support Vector Machine Mapping to propagate well property from borehole onto 3D seismic space using SVM Training Engine
- SVM mapping is a geostatistical inversion method, which will have higher resolution and best fit with well dataset.

7. Reservoir Prediction

- Detailed Structural Mapping and analysis
- Strata-slicing which divides the variable-thickness vertical interval between two seismic reference horizons into a fixed number of uniformly spaced subintervals. The sliced attributes/property will significantly deepen your understanding of your stratigraphic facies and your depositional history of your reservoir
- Fluid prediction based on water saturation and porosity property
- Sand estimation based on volume of shale and porosity property
- Integrated Reservoir Characterization & potential well suggestions