

Benefits of Automation of Well Model Management in Digital Transformation Journey

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Abstract

Objective:

Automatic well model management (AWMM) is a digital solution for managing and maintain well model life cycle as a part of digital transformation journey for thousands of wells in KOC. AWMM as a digital solution in KwIDF for KOC is able to achieve the following objectives:

Integrated solution to extract well data from the corporate data sources, transform and load the data into data warehouse in a structured way so that the data is used for building, updating and calibrating well models automatically.

Data management and data governance rules to identify data quality for building and updating well models. Standardization of business process in order to create and update well models automatically.

Standardization and automation of engineering workflows.

Financial and operational benefits by reducing the cost of well model management and improving the quality of well review and well performance analysis.

Procedure:

AWMM solution started with the identification stage where team started identifying business process, data sources, engineering workflow to be automated, technology to be used and data gaps exists in order to create physical well models then team started finalizing ETL process, data management and data governance policies and procedures in order to update data warehouse in KOC so that engineering workflow can consume the data without any issues. Next stage was to finalize the business processes for updating or creating well models and calibrating well models including field activities like workover, rig less, new drill wells, artificial lift conversion and well performance changes then develop the engineering workflows to automate the well model building and calibration activity based on the data availability, well performance changes and engineering logics. Finally, an intuitive UI is design to meet the end user's requirements to track well models and there calibration status for thousands of wells. Navigation, KPI's and triggers are part of the UI to help engineers to identify actionable items.

Results:

Centralize data management and data governance rule for creating and updating well models automatically. Improved efficiency by standardization of business process and workflow.

Cost benefits by reducing man hours and software licenses used for creating and updating well models. Operational benefits by improving well performance analysis and increase in optimization opportunities.

Conclusions:

Analyzing and troubleshooting well performance using data driven and physics based models has become a new normal in the industry but companies still find it challenging task to keep well models up to date so that they are used in decision-making process.

Engineers spend lot of time in updating the models but due to lack of data consistencies, accuracy, engineering assumptions and timely availability models utilization is minimum in decision-making process.

To fill the gap so that engineers spend the time in decision making rather than updating and calibrating models, KOC decided to have an integrated solution in KwIDF platform that will automatically update or create well models and calibrate them to the historical production data. A good foundation is necessary for an enterprise level digital transformation project; this model management technique will pave a way for a complex digital twin project that want to use data driven and physics based modelling to improve and optimize field production over time.