

REVIEWER'S REPORT

Manuscript No.: IJAR-59530

Title: AI-Enabled Real-Time Drilling Optimisation for Smart Oil and Gas Fields in Saudi Arabia: Integrating MWD/LWD, Automated Well Planning and Predictive Wellbore Risk Management.

Recommendation:

Accept as it is

Accept after minor revision.....

Accept after major revision

Do not accept (*Reasons below*)

Rating	Excel.	Good	Fair	Poor
Originality	✓			
Techn. Quality		✓		
Clarity		✓		
Significance	✓			

Reviewer Id: JPR-286

Reviewer's Comment for Publication.

The manuscript addresses an important and timely topic concerning the application of artificial intelligence to real-time drilling optimisation, automated well planning, and predictive wellbore risk management in Saudi Arabia. The integration of measurement-while-drilling (MWD), logging-while-drilling (LWD), machine-learning-based prediction, and risk-bounded decision support provides a relevant framework for improving drilling efficiency and operational safety. The manuscript is generally well organised, technically informative, and supported by recent literature.

The major strength of the paper is its emphasis on uncertainty management, physical constraints, human supervision, and independent validation rather than simply maximising the rate of penetration. The proposed deployment framework and staged validation protocol are practically relevant. However, a few minor revisions are recommended before publication:

- Review methodology:** Provide more detailed information about the databases and search platforms used, the search strategy, and the screening procedure to improve the transparency and reproducibility of the literature review.
- Critical synthesis:** Strengthen the comparative analysis of the thirty selected publications by highlighting their respective methodological strengths, limitations, validation approaches, and applicability to Saudi drilling operations.
- Saudi Arabian context:** Further clarify the extent to which the reviewed evidence is directly derived from Saudi oilfields and distinguish it from findings obtained in other geological and operational settings.
- Figures and tables:** Ensure that Figures 1 and 2 are clearly presented, properly labelled, and consistent with their descriptions in the text. Review the formatting and readability of Tables 1 and 2.
- References and language:** Check the consistency of reference formatting, bibliographic details, and DOI information. Minor language editing is recommended to improve readability and eliminate any grammatical or stylistic inconsistencies.

International Journal of Advanced Research

Publisher's Name: Jana Publication and Research LLP

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Final Recommendation: Accept after minor revision. The manuscript has good potential for publication after the authors address the above points, particularly the transparency of the review methodology and the comparative synthesis of the available evidence.