Survey QAQC Activity Report

Phil Harbidge

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Phil Harbidge - PathControl, General Manager - Kuala Lumpur
21+ years Wellbore Positioning
Well Placement, CA, Risk Assessment, Survey QAQC & Optimization
ISCWSA Webmaster and Survey QAQC Sub-committee Chair,
Drilling Data Quality and Uncertainty Description Sub-Committee

Work : **PathControl :** **Intercept, Relief Well, P&A, Wellplacement, Survey Management, Advanced Survey Corrections, Software Setup, Database Audits, Training and more**

Worked :

Sperry-Sun, Baker Hughes INTEQ and Schlumberger: DD Service Companies
Marine Surveyor and Civil Engineer and the Planetary Space Science Research Institute

MWD GYRO DSR & DEPTH QAQC e-Book Project

DEPTH e-book content

DONE

GYRO – chapter
Formatting + Diagrams

MWD – chapter
Formatting + Diagrams

QAQC Minimum requirements document

Formatting

Directional Survey Records (DSR) chapter
Formatting + Diagrams

MSA and MSA ERROR MODEL RECOMMENDED PRACTICE CHAPTER/ DOCUMENT

Drilling Data Quality and Uncertainty Description Subcommittee Activity Report

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SPE Affiliated "DDQUD" - (DSATS - DUPTS - WPTS Subcommittees)

- Standardize the Industry
- Drilling Data Quality
- Drilling Data Uncertainty

- Publish use cases DSABOK & SPE Paper use cases worked up into Semantic Graph and Data Lake

SPE DDQUD Full Presentation

User Stories
- Wellplacement
- Collision Avoidance
- Depth
- Kick Tolerance and more

- Pain Points

- **Formed in Sept 2020**
- **DSABOK web repository**
- SPE-208754-MS 2022 **Submitted Peer Review open access**
- SPE-Journal Article 2022

Methodology

- The approach taken by DDQUD was to:

  (a) create a list of user stories along with associated key drilling data

  (b) rank the criticality

  (c) for the most critical user stories, break down the user stories into use cases (ref. https://en.wikipedia.org/wiki/Use_case), and

  (d) develop a method to describe uncertainty and quality for the use cases.

- This uses data modeling (ref. https://en.wikipedia.org/wiki/Data_modeling): data and knowledge representation, semantic networks (ref. https://en.wikipedia.org/wiki/Semantic_network), and multi-layered graphs.

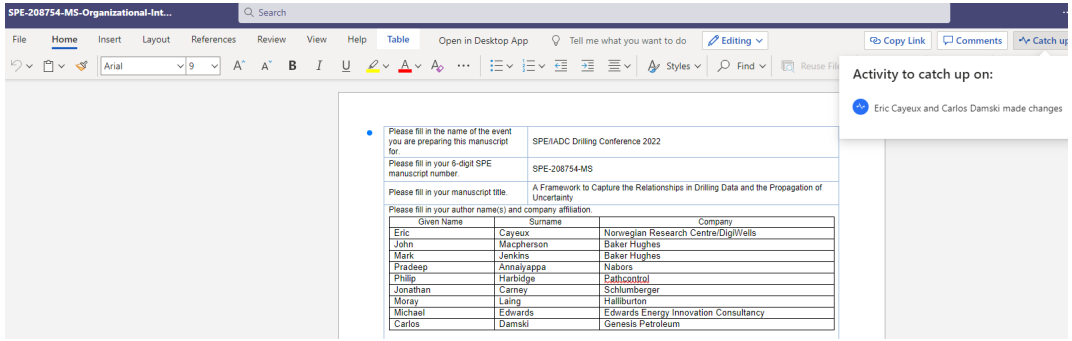
DSABOK

SPE Wellbore Positioning Technical Section / **Industry Steering Committee on Wellbore Survey Accuracy**

ISCWSA produces, maintains, and publishes standards for the industry, promoting a collaborative understanding of issues associated with wellbore surveying.

Paper for the SPE/IADC Drilling Conference 2022

SPE-208754-MS



Drilling oil and gas wells is a complex process involving many disciplines and stakeholders. This process occurs in a context where some pieces of information are unknown, or are often incomplete, erroneous or at least uncertain. Yet, during drilling engineering and construction of a well, drilling data quality and uncertainty are barely addressed in an auditable and scientific way. Currently, there are few or no placeholders in engineering and operational databases to document uncertainty and its propagation.

USER STORIES // DATA MODELS FRAMEWORK // SEMANTIC NETWORK // DATA LAKE // UNCERTAINTY PROPAGATION INFLUENCE DIAGRAMS and GRAPH THEORY

Thanks to

Manufacturer & Calibration Experts: BenchTree, Scientific Drilling, Halliburton, Gyrodata, Schlumberger, Baker Hughes, Weatherford and JAE

Operator Experts: Chevron, Oxy, ConocoPhillips, BP, Total, Devon Energy, ExxonMobil ….

Service Company Experts: Baker Hughes, Halliburton, Depth Solutions, Schlumberger, Weatherford, Gyrodata, Scientific Drilling, Mostar Drilling, SuperiorQC, Independent Consultants, EOG Resources, PathControl….

DDQUD





Questions?