The transformative influence of
Surface Logging

Geolog's step towards technology is an example of how digital transformation has been influencing various industries. Processes such as 'surface logging' have proven to be crucial in obtaining valuable data, resulting in effective decision making within the industry.

GEOLOG INTERNATIONAL IS an oilfield services company delivering solutions to national, international and independent oil, gas and geothermal operators. Founded in Milan, Italy in 1982, Geolog has continued developing effective and alternative solutions to complex and expensive downhole measurement tools.

Numerous applications of artificial intelligence and machine learning are being implemented across the oil and gas industry, and amongst these applications are those which allow the prediction of formation petrophysical properties, borehole issues and stuck pipe prediction, identification of drilling dysfunction such as bit wear, and the optimization of drilling parameters. Taken together, these applications have the ability to allow improved performance whilst delivering improvements in safety outcomes.

Geolog says that the key element in all data-intensive projects is the original data, and the single point of failure in these projects is 'data quality' including all aspects of consistency, integrity, accuracy, and completeness. The clear challenge is to effectively query heterogeneous data sources, then extract and channel data towards one or more advanced machine learning models to effectively achieve a data-driven workflow that leads to effective and correct automated decision making.

The company believes that data is generally considered to be of high quality if it is fit for its intended uses in operations, decision making and planning. Furthermore, data is deemed of high quality if it correctly represents the real-world construct to which it refers.

According to Geolog, within the oil and gas industry, a long recognised primary data source has been provided by surface logging, which has consistently proved to be a critical pillar, supporting applications in both conventional data analysis and the developing digital era. The increasingly widespread adoption of advanced data analysis techniques is enabling integrated surface-acquired data to return to the centre stage in understanding drilling operations and downhole environment issues in real-time.

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The ability to utilise surface-acquired data, delivered without downhole tool acquisition systems, can achieve potentially substantial cost savings, critical in the currently constrained environment of many operators. The ability to facilitate improved decision making and outcomes in environments where downhole systems are either cost-prohibitive in their deployment, or where the technical or financial risks associated with such systems call into question their use, will positively impact the economics of drilling operations.

Crucial to the utility of surface-acquired data derived through these methods is the quality of the original data sets. Without adequate control over the quality of the data inputs to the modelling process, unacceptable errors may be introduced into the outputs from the system. Regardless of the capabilities of newly developed data analysis methodologies, if the data they are built upon is fundamentally flawed by inadequate initial quality control, then the conclusions extracted will themselves be flawed: the old adage of garbage in – garbage out still applies. Therefore, the use of data captured via a fully QC'd source is critical in both the reliability and accuracy of data outcomes delivered using these new techniques. More than ever, a quality surface logging service delivers real value to the end-user. ▪