

Embracing the Digital Revolution from an Oil and Gas Perspective: Total's Experience

Henri Houllévigie¹

¹Total

ABSTRACT

Integration has been the 2000-2010 motto for oil companies, ban the silos! Integration, transversality, communication, facilitated through company organization or platforms for better efficiency thanks to an increased experience sharing. "People are our core value" was also another motto, but in ancient days, being nominated a data manager was not usually foreseen as a promotion. Hence, quality and size of data have always been significant for geoscientist, but more as a support to people's experience and creative ability to invent new themes or prospects from the brain's library or analogs. In those days, Chess and Go human champions were winning over the machine. This not true anymore. Meanwhile, recent years also are characterized by a data deluge. It was considered in 2014 that 90 percent of the available data had been gathered during the two years prior. Computer power is still complying with an adapted Moore's law. In the oil and gas business, sensors numbers have exploded in seismic (1TBytes for standard marine 3D to 50+Tbytes for WAZ). The latest rigs are equipped with about 80,000 sensors. The G&G domain is still a model driven system, with a huge need of expertise. In the 1980s, Total started to build some machine learning processes into its proprietary SISMAGE interpretation software (Seismic trace classification & Pseudo Gamma-ray). During the 1990s, Neuron Network lost its fashion, only to rise again in the 2010s thanks to the HPC progress. We now are able to use millions of neurons instead of hundreds through a process called Deep Learning. In this presentation, Total share results obtained by artificial intelligence: microfossils classification, well log interpretation and automatic feature or pattern recognition. The presentation also covers insights into Total's digital organization and road map. Will "Data (and the computer) is our core value" be the new motto? Hopefully not. In Total, digital is technology of course, but it is more a question of how it will impact our way of working, how the user (person) is going to take ownership of the apps (applications). Therefore, specialties are leading the digital transformation process. The question is not to push for new technologies, but to discover how we can make the best, most efficient use of them.